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Vol. 17. No. 2. pp. 63-114
Abstracts 265-510

February, 1947

IMPERIAL MYCOLOGICAL INSTITUTE
3 APR 1947

THE VETERINARY BULLETIN

1947

The delay in publication is regretted. It is due to the damage sustained by the printers through enemy action. It is hoped that normal dates of publication will soon be resumed.

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IMPERIAL BUREAU OF ANIMAL HEALTH

THE

VETERINARY BULLETIN

Vol. 17.] February, 1947. [No. 2.

DISEASES CAUSED BY BACTERIA AND FUNGI

McDiarmid, A. (1946.) **Studies on enzootic staphylococcal infection in lambs associated with tick-bite. I.—The nature of the disease, clinical findings and differential diagnosis.**—*Vet. Rec.* **58.** 103–104. **265**

In this preliminary paper the author suggests "enzootic staphylococcal infection of lambs associated with tick bite" as a more accurate description of the disease of lambs which, hitherto, has been referred to as "tick pyaemia". A series of P.M. examinations was carried out on lambs to secure a differential diagnosis and eliminate those which died from concurrent infections such as louping ill, tick-borne fever, pulpy kidney disease, and lamb dysentery. Coagulase-positive haemolytic staphylococci were recovered in all of the five cases cited, but in only one case did the infection appear to be uncomplicated by the presence of another disease. Enzootic staphylococcal infection can be subdivided into two main classes: (1) an acute or septicaemic type, in which death is sudden and P.M. lesions are like those of toxaemia and (2) a chronic or pyaemic type, which is not necessarily fatal.

—G. B. S. Heath.

Graves, F. W. (1943.) **Augmenting war-time milk production by converting cows condemned for mastitis to useful three teaters.**—*Ann. Rep. N.Y. St. Ass. Milk Sanit., 1943.* pp. 11–12, 14, 16, 18, 20 & 22. **266**

Temporary drying-off of the affected quarter is advised as an expedient for cows with good production records but with one quarter so diseased or injured that a long period of treatment would be necessary, or complete recovery doubtful. The diseased quarter is not milked for 14–16 days, then it is milked out thoroughly. At the end of another 14–16 days it is again milked out. In at least half the cases so treated the quarter will have become completely inactive.

In cases where a quarter is secreting a small quantity of purulent material, or in which it is not completely dried by the previous treatment, permanent destruction of the affected quarter should be advised. The quarter should be milked dry and a teat siphon attached by a rubber tube to a stoppered bottle containing 3–4 oz. of ether should be inserted deeply into the teat canal. The bottle of ether should be immersed in a bucket of water at between 120°–130°F., so that the ether is vaporized. The vapour will pass into the quarter and reach its most remote areas. A few minutes after injection the animal is a little uneasy: this lasts for about 10 min. Within 24 hours the quarter will be considerably swollen, but this will recede in about ten days. No further treatment is needed, but after 28–30 days all unabsorbed exudate should be milked out. Both temporary and permanent drying-off can be carried out at any stage of lactation, but should not be practised when the quarter is acutely infected.—J. O. L. King.

Verlinde, J. D. (1940.) Aetiologische, epidemiologische en serologische onderzoekingen over adenitis infectiosa equorum. [**Aetiological, epidemiological and serological investigation of strangles in horses.**]—*Tijdschr. Diergeneesk.* **67.** 636–644. [English, French and German summaries.] [Abst. from English summary.] **267**

In a study of strangles in army horses, V. distinguished two forms, one with uncomplicated catarrh of the larynx and trachea and one with abscesses of the retropharyngeal and submaxillary glands. *Streptococcus equi* could be isolated in both types from purulent nasal or glandular discharge. Cultures proved very pathogenic to mice and rabbits. Two of the eight strains were slightly variant with regard to lactose fermentation and were strongly agglutinated by all sera tested from convalescent horses; the typical strains were only agglutinated to a limited degree and almost exclusively by homologous serum. The author considers that further attempts should be made to achieve active immunization.

WATSON, R. F., ROTHBARD, S., & SWIFT, H. F. (1946.) **Type-specific protection and immunity following intranasal inoculation of monkeys with Group A hemolytic streptococci.**—*J. exp. Med.* **84.** 127–142. [Authors' summary and conclusions copied *verbatim.*] **268**

Nasopharyngeal carrier states of several weeks to several months duration were induced in the *Macaca mulatta* by the intranasal inoculation with matt strains of group A streptococci.

Following such a successful inoculation with a particular type of group A streptococcus, the animal was usually resistant to reimplantation with that same type for several months to a year or more, although reimplantation with a heterologous type could generally be easily affected. This resistance was shown to be closely correlated with the antibodies directed towards the type-specific M antigen, not toward the T antigen of the strains employed. A majority (83·8 per cent) of the animals in which intranasal inoculation was followed by successful implantation developed significant increases in the antistreptolysin O titres of their sera ; and in a limited number of instances, type-specific agglutinins and bacteriostatic antibodies were demonstrable in the animals' sera following successful implantation.

Nasopharyngeal carrier states could not be induced with the glossy, avirulent variants of group A streptococci ; these animals, moreover, failed to show antibody responses and were susceptible to implantation with the matt variants of the homologous glossy strains.

The findings are in accord with the known facts regarding immunity to group A streptococci gained through experiments on rodents ; and the possible relationship of these observations to the problem of type-specific immunity in human beings is discussed.

OSTROLENK, M., & HUNTER, A. C. (1946.) **The distribution of enteric streptococci.**—*J. Bact.* **51.** 735–741. [Authors' summary copied *verbatim.*] **269**

Fifty-one fecal specimens and two soil samples were examined for enterococci and coliform organisms. The two soil samples were negative for both enterococci and *Escherichia coli.* Forty-nine specimens representing 10 animals contained enterococci in from one-tenth to one-millionth of a gram of feces. *E. coli* was present in 46 specimens and was recovered in dilutions ranging from 1 : 100 to 1 : 10,000,000.

Acidity was produced in 71 tubes of " SF " broth, of which 60 contained fecal streptococci alone or in combination with rods. Eleven tubes were false positive (acid), containing bacilli but no streptococci. Four and six-tenths per cent of the inoculated tubes were false negative (no acid), containing fecal streptococci without evidence of acid production.

The addition of 6·5 per cent sodium chloride to the " SF " medium reduced the number of false positive reactions from 4·3 per cent to 0·7 per cent, but did not appreciably influence the occurrence of false negative reactions.

MØRCH, E. (1945.) **Capsular antigens common to a streptococcus strain and some pneumococcus types.**—*Acta path. microbiol. scand.* **22.** 159–164. [In English.] **270**

A non-haemolytic strain of streptococcus belonging to the serological Group H and which had been isolated from a human throat was found to possess capsular antigens common to six types of pneumococcus. In immune sera against the streptococcus strain produced from rabbits, capsular swelling was evident with only two types of pneumococcus.—J. C. BUXTON.

EVANS, A. C. (1944.) **Studies on hemolytic streptococci. VII. Distinguishing characters of the lactose-negative species of Lancefield's Groups A and C. VIII. Streptococcus equisimilis.**—*J. Bact.* **48.** 263–265 & 267–284. [For previous parts, see *V. B.* **11.** 739.] **271**

VII. The author defines the differential characters of *Streptococcus equisimilis*, an organism occurring in various animals and in man. She proposes to classify the streptococci of the pyogenic group which do not hydrolyse sodium hippurate as follows :–

" a. Precipitin group C (sensitive to filtered phage B).
  b. Sorbitol fermented.
    1. Trehalose not fermented, lactose fermented : *Streptococcus* sp. (Animal pyogenes).
  bb. Sorbitol not fermented.
    2. Trehalose and sorbitol not fermented. *Streptococcus equi.*
    3. Trehalose fermented, lactose may or may not be fermented. *S. equisimilis.*
  aa. Precipitin group A (resistant to filtered phage B). Trehalose fermented, sorbitol not fermented."

(Subdivision of group A species will follow further study.)

VIII. Fifty-three strains of *Str. equisimilis* were studied, in order to determine the type strain and the variant characters of the species.

The type strain falls into Group C, is sensitive to filtered 'phage B and ferments trehalose and

salicin, but not sorbitol or lactose (other strains varied in their ability to ferment lactose). There are agglutinative differences between the various strains.

It may occur on the normal mucosae of man and animals and may cause infection in man, animals and birds. Animal infections so far reported include strangles, respiratory catarrh, pneumonia, sinusitis and wound infections.

—I. W. JENNINGS.

LEVY, A. J. (1946.) **A gastro-enteritis outbreak probably due to a bovine strain of vibrio.**—*Yale J. Biol. Med.* **18.** 243–258. **272**

Milk was suspected as the vehicle for an infective agent which caused a serious outbreak of gastro-enteritis in Illinois. An organism resembling *Vibrio jejunum*, rather than *V. foetus*, was isolated by blood culture and from the faeces of those infected. Cultures grew poorly at first, except when tryptose phosphate beef broth or brain broth was used. Attempts to trace the source of the suspected milk failed because information about the health of the herds involved could not be obtained, but the outbreak ceased when the milk was heat-treated. The literature dealing with vibrio-like organisms is discussed, with special reference to their occurrence in bovine animals.—J. KEPPIE.

*MÜLLER, M. (1942–43.) Das verborgene Vorkommen von Tuberkelbacillen in Fleisch, Blut und normal erscheinenden Organen tuberkulös erkrankter Schlachttiere. **[Tubercle bacilli in flesh, blood and apparently normal organs of tuberculous slaughter animals.]**—*Dtsch. SchlachthofZtg.* **42.** 58–60, 167–169, 209–212, 237–240, 321–324, and **43.** 29–33. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 228.] [For previous parts, see *V. B.* **13.** 275.] **273**

M. discusses the utilization according to the German methods, of the carcasses of TB.-infected cattle. There is no new information.—J. ZWEIG.

CHRISTIANSEN, M. J. (1943.) Graesmarksinfektion og Kvaegtuberkulose. Tuberkelbakteriers Levedygtighed i det fri, belyst ved praktiske Førsog. **[Pasture infection and bovine TB. Viability of tubercle bacilli in the open ground.]**—*Maanedsskr. Dyrlaeger.* **54.** 241–305. **274**

C.'s investigations were made during the summers of 1937–41 under circumstances as realistic as possible, pastures with natural pools being used.

In one group of experiments, the pasture was infected by the excretions of diseased cows, kept there for some time. Ten cows affected with severe TB. of the lungs, uterus and udder were kept in a field of 0·5 hectares for ten days. Twenty-four hours after they had been removed, two heifers free from TB. were put into the field, followed at intervals of 2–3 days by another 12 heifers, each of which stayed 14 days. One of the heifers put in 24 hours after the removal of the sick animals and another put in seven days afterwards became infected; the others did not. Having repeated and varied the experiments, C. concludes that infection never took place later than seven days after the diseased cows had been removed from the field.

A circular water pool 3.5 m. wide and 2 m. deep at its deepest part was infected in the spring with a fresh Besredka culture of material from bronchi and lungs of tuberculous cows. Healthy heifers having access to the pool 18 days later, contracted infection. Other healthy heifers watered from the same pond but kept 2–3 m. away remained uninfected. In another experiment, healthy calves remained uninfected although they drank from the same brook as infected cows 50 m. upstream.

Liquid manure from receptacles and from dunghills of severely infected herds was spread on a pasture. Healthy heifers were not infected from manure even when they were grazed on a field just after the manure had been spread. G. pigs were not infected by being fed hay from a field where infected cattle had grazed. When cows with severe TB. were separated at pasture from healthy heifers by only a fence of barbed wire, none of the healthy animals contracted the disease.

Tubercle bacilli were still alive after 45 days on pasture in cow dung from an animal with TB. of the lung. Soil in contact with artificially contaminated faeces contained viable tubercle bacilli 7–8 weeks after first contact: the faeces had meanwhile rotted away. In general, it seems that the risk of spreading bovine TB. in the open air is surprisingly low.—H. C. BENDIXEN.

LÁSZLO, F. (1943.) Tuberkulose in den Nebennieren bei Schweinen. **[Tuberculosis of the adrenals in pigs.]**—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 174–175. **275**

Greyish-white, sharply defined foci of TB. were found in the adrenal glands of two pigs, giant cells and acid- and alcohol-fast bacteria being present. Necrosis was not noticeable and the lesions were of the granulomatous type associated with the avian type of bacillus.—R. A. ROPER.

BERTHELON, M. (1943.) Observations sur la tuberculose utérine de la chatte. **[Tuberculous metritis in the cat.]**—*Rec. Méd. vét.* **119.** 5–7. **276**

Two cases in cats one and a half and four

and a half years old were diagnosed clinically and at P.M. examination. In the first case the popliteal and superficial inguinal nodes were affected, and the skin had apparently been the portal of entry. In the second case, the uterus was assumed to have been infected *post-partum*. The digestive and respiratory tracts were not involved. The differential diagnosis of tuberculous metritis in the cat is discussed.—M. L. LEVI.

YELTON, S. E. (1946.) **Tuberculosis throughout the world. I. The prewar distribution of tuberculosis throughout the world.**—*Publ. Hlth Rep., Wash.* **61.** 1144–1160. [Author's summary copied *verbatim.*] **277**

Tuberculosis appears to be widely disseminated throughout all areas which have been to any degree subject to the influence of civilization.

The only countries which can be said with any certainty to have tuberculosis death rates of less than 50 per 100,000 in the prewar period are Denmark and the Netherlands in Europe, the United States, and Australia. If the rates for the white population only are considered, New Zealand and the Union of South Africa may be added to this list.

A high prevalence of tuberculosis probably exists throughout eastern Europe and Asia, with the possible exceptions of Ceylon and Palestine, where the reported rates are fairly low. Very high rates were found in Alaska, Greenland, Newfoundland, and Labrador. It is probable that all Latin America experiences a very high prevalence of this disease. It is also probable that the prevalence of tuberculosis is fairly high in North Africa with the possible exception of Egypt, although definite data are meager.

Certainly tuberculosis control is a problem of world-wide importance. The prewar distribution of this disease is alarming, and it is certain that the problem will be intensified during the postwar years, particularly in Europe.

MCCOORD, A. B., KATSAMPES, C. P., & CLAUSEN, S. W. (1946.) **Effects of intranasal inoculation with tubercle bacilli on vitamin A stores and tissues of mice and rats.**—*Amer. Rev. Tuberc.* **54.** 84–91. [Spanish summary.] [English summary copied *verbatim.*] **278**

Mice and rats were inoculated intranasally with virulent human tubercle bacilli. Many of the animals died. The involvement remained mostly localized in the lungs. The lesions in the lungs indicated a reaction to viable, if not actually multiplying, tubercle bacilli. The stores of vitamin A in the animals were depleted as a result of the inoculation.

PAGEL, W., & HALL, S. (1946.) **Aspiration type of congenital tuberculosis.**—*Tubercle, Lond.* **27.** 153–158. [Authors' summary and conclusions copied *verbatim.*] **279**

The case is reported of a female infant, aged 17 days, with universal spread of submiliary foci throughout both lungs and confluent caseation in the hilar lymphatic glands, the abdominal organs being practically free, and the mother failing to show any evidence of tuberculosis—apart from an uncharacteristic pyrexia after delivery.

Caseous plugs abounding with acid-fast bacilli were found to fill dilated bronchioli and alveolar ducts, forming "multilocular" foci resembling those obtained in the experimental animal in primary intratracheal infection with heavy inocula and consistent with infection by coarse aspiration.

The case is, therefore, presented as a further observation of the "Aspiration-Type" of Congenital Tuberculosis, additional to the very few instances so far reported in the literature.

The histological pictures conveyed a suggestion of aborted alveolization of the lungs, possibly due to the tuberculous infection of the foetus.

HILL, H. W. (1946.) **"Speed of reaction" hypothesis. II. Further numerical implications regarding tuberculosis.**—*Amer. Rev. Tuberc.* **53.** 1–33. [Spanish summary.] [English summary copied *verbatim.*] [For previous article, see *V. B.* **14.** 408.] **280**

The natural course of a tubercle infection of guinea pig or person (with living virulent human type bacilli) is pictured in seven simple numerical tables as a rising tide of bacilli which, unless checked by antibacterial immunity, inevitably reaches, sooner or later, numbers great enough to precipitate, through their pathogenic products, material damage enough to constitute a "case", going on to a fatal ending.

This latter is the natural course of such an infection in normal guinea pigs. In contrast, most human North American white infectees (92 per cent ?) respond sooner or later with antibacterial immunity units, to the immunity-eliciting stimuli (immunogenic units) produced by the infecting bacilli.

The *immunogenic* units, being released by the bacilli, one unit from each bacillus, increase in number as the infection advances; which numbers therefore increase exactly in correspondence with the increases in the numbers of the bacilli. But the *immunity* units which the immunogenic units thus elicit from responsive tissues (each immunogenic unit inducing one immunity unit) depend for the time of their appearance, as actively functioning antibacterial agents, upon the particular speed with which the particular

infectee's tissues may react to the immunogenic stimuli they receive.

In the guinea pig this speed of reaction is invariably so slow that the time-lag between the immunogenic stimulus and the immunity response is too great to permit the appearance of sufficient immunity to check materially a virulent infection before fatal damage has already been done.

Human infectees, unlike the guinea pigs, vary in their speeds of reaction from infectee to infectee. Only perhaps 8 per cent of North American whites have such long immunity time-lags as all guinea pigs show. These, like the guinea pigs, die, unless aided by some form of antibacterial therapeusis.

Of the remaining 92 per cent (?) human infectees, the majority inherently possess such short immunity time-lags (that is, such rapid speeds of reaction) that a (small) antibacterial immunity appears early, hence while the bacilli are relatively few; the infection being thus ended early, with little or no serious damage.

Just so, one gallon of water may extinguish an incipient fire, if it is applied early; whereas thousands of gallons may fail to put out the fire if not applied until later.

The remaining minority, perhaps 15 to 20 per cent of the total human infectees, possess somewhat longer time-lags; therefore material damage is done by the relatively huge numbers of bacilli which have appeared before substantial immunity appears. But those huge numbers of bacilli induce in due time equally huge numbers of immunity units; thus ultimately quelling the infection, which therefore ends in recovery.

The seven tables illustrate the numerical details of the various processes above outlined; dealing with single infections, metastases, reinfections, etc. in the absence of immunity, and in its presence.

YOUMANS, G. P. (1946.) **A method for the determination of the culture cycle and the growth rate of virulent human type tubercle bacilli.**—*J. Bact.* **51.** 703–710. [Author's summary copied *verbatim.*] **281**

By the use of micro-Kjeldahl nitrogen determinations, the culture cycle of the virulent human type tubercle bacillus, strain H37Rv, was determined. From the logarithmic portion of the growth curve, the growth rates and generation times were calculated. Under the conditions of the experiment the generation times were found to vary between approximately 1½ and 3½ days. The usefulness of the method for accurately determining the amount of growth of tubercle bacilli and the effect on the rate of growth of alteration of the composition of the medium and of the presence of growth-inhibiting substances is illustrated.

STEENKEN, W., Jr., & GARDNER, L. U. (1946.) **History of H37 strain of tubercle bacillus.**—*Amer. Rev. Tuberc.* **54.** 62–66. [Spanish summary.] [English summary copied verbatim.] **282**

This strain of *M. tuberculosis* was isolated in the Saranac Laboratory forty years ago. Transplants have been used so widely throughout the United States in basic research like that of Anderson on the chemistry of the tubercle bacillus and of Sabin on its protein constituents that a detailed record of its life history is now being published. At times, transplants of this micro-organism in different laboratories have undergone spontaneous dissociation with persistence of only avirulent mutants. Under proper conditions of cultivation, however, it is possible to maintain full virulence. The virulent dissociant will be among the strains carried by the Culture Depot of the National Tuberculosis Association for distribution to investigators in the fields of chemotherapy and other research.

*SPANDONARI, A. (1942.) Di alcune azioni enzimatiche contenute nel pus tubercolare. **[Enzymes in tuberculous pus.]**—*Arch. méd. chir.* **11.** 189. [Abst. in *Amer. Rev. Tuberc.* **52.** No. 3. p. 45 of absts, copied *verbatim.* Signed: G. SIMMONS.] **283**

The glycolytic activity of tuberculous pus is considerable and can destroy 25 per cent of the glucose present. This enzyme originates not only in the leucocytes but also in the plasma. The amylolytic action of the pus is due to the diastase of the leucocytes. The proteolytic enzymes come mainly from lymphocytes.

ROSENTHAL, S. R., BLAHD, M., & LESLIE, E. I. (1945.) **Ten years' experience with BCG (experimental and clinical).**—*J. Pediat.* **26.** 470–480. [Authors' summary copied verbatim.] **284**

In a study with BCG vaccination where special emphasis was placed on having adequate controls and where the multiple puncture technique was used to introduce the vaccine, the following results were obtained:

1. BCG has been found to be entirely innocuous both locally and generally in animals studied over a period of ten years and in infants studied over a period of seven years.

2. In 1,204 vaccinated children where no source of contact with tuberculosis was known, there were three cases of tuberculosis and one death from the disease; whereas in 1,213 controls there were twenty-three cases of tuberculosis and four deaths from the disease.

3. In ninety-eight vaccinated newborn in-

fants who were in contact with tuberculosis following vaccination there was one case of tuberculosis and no deaths; whereas in sixty-three controls there were four cases of tuberculosis and three deaths.

4. Considering the contact and noncontact group as a whole, there were twenty-seven cases of tuberculosis in the control group against four cases in the vaccinated; there were seven deaths from tuberculosis in the control group and one in the vaccinated.

5. There were ten cases of tuberculosis in siblings not included in the control groups, and one death from tuberculosis in this group.

6. From these results, it may be concluded that in the first seven years of life BCG vaccination is of definite value in the prevention of tuberculosis.

FEENSTRA, E. S., CLARK, C. F., & THORP, F., Jr. (1945.) **Artificially induced case of pyelonephritis in a bovine.**—*M[ich.] S[t.] C[oll.] Vet.* **5.** 147–150. **285**

Typical symptoms of pyelonephritis developed after cultures of *Corynebacterium renale* were injected into the urethra of a year-old steer, this being confirmed P.M. by the typical pathological lesions in the left kidney. Pure cultures of the organism were recovered from the kidney and bladder.—B. WEITZ.

STAFSETH, H. J., BRYAN, C. S., & NEU, L. (1946.) **On the etiology of abscesses in goats.**—*N. Amer. Vet.* **27.** 22–25. **286**

From multiple abscesses occurring in several goats in a herd, an organism was isolated which was identified tentatively as *Corynebacterium ovis.* Subcutaneous and intradermal injection of the organism into two cows produced abscesses similar to those in the goats and the organism was recovered from the lesions. No systemic reaction was detected in the goats and the organism was not found in the milk. In cows infected experimentally and given sulphanilamide, on the other hand, there were pyrexia, loss of appetite and almost complete loss of milk secretion. No serological tests were carried out with the organism, nor were inoculations with it made in small laboratory animals.—E. G. WHITE.

*COLANTUONI, A. (1940.) Sulla presenza del bacillus mallei nel latte di asina infettata sperimentalmente di morva. [*Pfeifferella mallei* **in the milk of an artificially infected donkey.**]—*Profilassi.* p. 169. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Dec. 10th. 431. (1943).] **287**

A lactating donkey died 16 days after artificial infection with *Pfeifferella mallei.* Milk taken on the third, ninth and 15th days following infection was injected in each case into four male g. pigs with negative results.—J. ZWEIG.

SCHMIDT, J. (1943.) Beitrag zum sogenannten Herztod der Schweine und seine Beziehung zum Rotlauf. [**Relationship of fatal syncope of pigs to swine erysipelas.**]—*Tierärztl. Rdsch.* **49.** 103–104. **288**

S. gives a general discussion of the subject, based on his own local experiences and the work described by KÖBE [*V. B.* **14.** 201], in which the existence of a filtrable virus was postulated as playing a role in the pathogenesis of the swine erysipelas bacillus. No new evidence is produced.
—E. KLIENEBERGER-NOBEL.

MCNUTT, S. H., LEITH, T. S., & UNDERBJERG, G. K. (1945.) **An active agent isolated from hogs affected with arthritis (preliminary report).**—*Amer. J. vet. Res.* **6.** 247–251. **289**

The authors were unable to isolate *Erysipelothrix rhusiopathiae* from more than about one-fourth of the cases studied of arthritis in young pigs in Iowa, in spite of the similarity of the lesions to those generally considered to be due to this organism. Exudate from the joint of a pig with lesions, which failed to yield cultures of *E. rhusiopathiae,* was injected into seven-day-old chick embryos and evidence of an infective agent was obtained. Inoculation into mice (subdural and intraperitoneal), g. pigs (subcutaneous, intramuscular and intraperitoneal) and rabbits (subdural, intramuscular and intraperitoneal) was without effect. Intranasal inoculation into mice in series was followed by pneumonia on the third passage. Pigs inoculated subcutaneously or intraperitoneally developed arthritis, pleurisy and peritonitis. After serial passage in chick embryos the virulence of the agent for the pig diminished but was restored by a single passage through the latter species; further passage resulted in an agent of greatly enhanced virulence with a strong predilection for the serous membranes. The agent was readily isolated from a variety of tissues from experimentally infected pigs. Only about 1–5% of the agent originally present remained after passing through a Berkefeld N filter. Agglutination with chick red cells indicated no relationship between the agent and swine influenza virus, the latter being much more active than the former in the chick embryo.—E. G. WHITE.

MOMBERG-JØRGENSEN, H. C. (1940.) Om Listerellosis og Listerella monocytogenes. [*Listeria* (*Erysipelothrix*) **infection.**]—*Maanedsskr. Dyrlaeger.* **52.** 222–233. **290**

A survey of the literature concerning listeriasis.—H. C. BENDIXEN.

LILLIE, R. D., & LARSON, C. L. (1945.) **Pathology of experimental tularemia in the golden hamster** (*Cricetus auratus*).—*Publ. Hlth Rep., Wash.* **60.** 1243–1253. **291**

A detailed report is given of the gross and microscopic pathological changes resulting from the experimental infection with tularaemia of 25 golden hamsters. Five different routes of inoculation were used and all tissues were examined. The findings were too numerous to allow an accurate summary to be made, but among the prominent changes were necrotic capillary thrombi containing organisms in the liver, lung and lymph nodes, extensive necrosis and fibrin exudation at the site of inoculation and venous thrombosis and alveolar haemorrhage in the lung. Clusters of coccoid and bacillary *Pasteurella tularensis* occurred in the endothelial cells throughout the body.

—J. KEPPIE.

VAHLNE, G. (1945.) **Serological typing of the colon bacteria with special reference to the occurrence of B. coli in man under normal and pathological conditions, particularly in appendicitis.** — *Acta path. microbiol. scand.* Suppl. No. 62. pp. 127. [In English.] **292**

In the introduction V. points out the difficulties of earlier serological investigators of the *Bacterium coli* group of organisms. KAUFFMANN (1941) was the first to succeed by means of systematic antigenic analysis in setting up a serviceable scheme for diagnostic purposes. Subsequently KNIPSCHILDT (1945) extended this scheme. V. repeated and extended the work of both these authors. He tried particularly to find whether certain types were more pathogenic than others, collecting strains from a wide range of pathological and normal materials. The final selection of the strains tested was made on serological criteria, *viz*, only those agglutinable by any of the 25 O-sera listed in the Kauffmann-Knipschildt antigen table for the *Bact. coli* group were examined extensively.

V. showed that the O-antigens of colon bacteria remain qualitatively constant for at least three years in storage and further, that all the O-inagglutinable strains of these examined could be made O-agglutinable by heating to 120°C. for two hours. Thus they could be typed by means of the antigenic scheme. V. also brought forward new evidence to show that the inhibition of O-agglutination is always due to a capsule. The number of K-antigens (K for *Kapsel*) found by KAUFFMANN and KNIPSCHILDT was increased by him from 24 to 55. V. was also able to prepare adequate H-antigens from the various *Bact. coli* strains, by using a modification of "Fischer's transmigration method" and was able to extend the Kauffmann-Knipschildt scheme by adding 22 H-antigens. In all, V.'s scheme contains 115 types of strains.

In addition V. carried out some cultural studies on part of his serologically defined material. He was thus able to confirm the findings of the other two workers with regard to the inadequacy of cultural tests for the purpose of typing.

Of particular interest is V.'s finding that the *Bact. coli* strains from pathological material are more uniform than those from non-pathological sources. There are more O-inagglutinable (capsulate) and haemolytic organisms among the strains from pathological conditions, and within each O-group strains from pathological material yield fewer types than those from other material. This indicates that there may be pathogenic types among the colon bacteria: it seems possible, according to V.'s results (Widal tests), that they are concerned in the aetiology of appendicitis.

The culture media and reagents employed are described in an appendix.—E. K.-N.

BRITTON, J. W. (1945.) *Shigella equirulis* **infection in California.**—*Cornell Vet.* **35.** 375–377. **293**

Case reports established the importance of *Bacterium equirulis* as a cause of foal mortality in California. The organism was recovered in pure culture from small multiple abscesses in the kidneys of a weakly foal which died on the fourth day after birth. Its gestation period had been unduly long—362 days. The same organism was involved to some degree in the deaths of two other foals which died when a few months old. One had impaction of the stomach, together with abscesses in the thymus, the kidneys and a mesenteric aneurysm. The other had laminitis, pericarditis and chronic nephritis. In a fourth case, in which a mare aborted twin foetuses, the organism was cultured from the placenta as well as from the liver, stomach and umbilicus of the foetus. The presence of haemolytic streptococci complicated the diagnosis in this instance.

—J. KEPPIE.

DE ASSUMPÇÃO, L., & RIBAS, J. C. (1943.) Incidencia de bacterias do gênero *Salmonella* em ratos da cidade de São Paulo. [**Incidence of salmonella in the rats of São Paulo.**]—*Mem. Inst. Butantan.* **17.** 127–140. [English summary.] **294**

The authors review briefly the role of rats in outbreaks among human beings of salmonellosis caused by infected foodstuffs and report the results of their study of salmonella organisms isolated from rats in São Paulo. In all, 950 rats, in groups of 5–20, were examined by culture of the spleens and livers. From eight groups salmonella were

isolated and studied serologically, the somatic and flagellar antigens being determined. All the strains isolated were identified as *S. typhi-murium*.—M. C.

MOMBERG-JØRGENSEN, H. C. (1942.) Paratyfus hos Sølvraeven. **[Paratyphoid in silver foxes.]** —*Maanedsskr. Dyrlaeger.* **54.** 20–31. **295**

During the summer of 1941 a number of rather severe enzootics caused by *Salmonella dublin* occurred on several fox farms. Food was boiled and premises were cleaned and disinfected. Puppies were given formolized *S. dublin* vaccine subcutaneously and the outbreak subsided. It was presumed that infection was derived from badly stored food of animal origin and a recommendation is made that such food should be kept in cool storage.

During the winter of 1941–42, the author studied bacteriologically 242 carcasses of apparently healthy foxes from 55 farms. *S. dublin* was found in the spleen, liver and mesenteric lymph nodes of eight foxes from four different farms. The author does not consider that the animals are real carriers of the bacteria.—H. C. BENDIXEN.

BOIVIN, A. (1941.) Sur le déterminisme de la virulence chez les bactéries. **[Determination of virulence of bacteria.]**—*Ann. Inst. Pasteur.* **67.** 377–379. **296**

The virulence of different strains of *Salmonella typhi-murium*, *S. paratyphi B* and *S. typhi* was studied by intraperitoneal injections into mice of graded doses of organisms either coated or not in mucin. Cultivation on artificial media was often followed by a decrease in pathogenicity as judged by the number of organisms necessary to kill mice. B. was not always able to correlate such changes in virulence with definite qualitative or quantitative changes in the somatic structure. Detailed data are not given, but from numerous experiments, B. concludes that virulence depends not only on the chemical composition (estimated percentage of sugars and fatty acids) and the toxicity and total amount of somatic antigen (O and/or Vi antigen when present), but also on some unknown property which tends to disappear on artificial cultivation.—M. L. LEVI.

ROGERS, H. J., & KNIGHT, B. C. J. G. (1946.) **The recognition of material present in horse muscle affecting the formation of α-toxin by a strain of** *Clostridium welchii*.—*Biochem. J.* **40.** 400–406. **297**

This paper records the examination of various materials for the presence of so-called toxigenic factors, *i.e.*, materials increasing the yield of α-toxin (lecithinase) per unit weight of bacterial matter formed, and attempts to purify and characterize such material from protein-free muscle extracts. Details are given of methods of analysis and culture employed. It was found that protein-free horse muscle extract contained labile material which enhanced α-toxin formation by *Cl. welchii* Type A. Concentrations were made of the extracts *in vacuo* and after partial purification some of the general properties of the factor(s) were studied and recorded.

The toxigenic factor is of relatively small molecular size; its activity is dependent upon the presence of primary amino groups; it is associated with hydrophilic substances and is stable to drastic treatment with acids but unstable in alkaline solution. It is suggested that the active component may be in the nature of an amino sugar. The inorganic iron concentration in some media is very important in its effect on α-toxin formation by *Cl. welchii*, but the nature of the relationship between Fe concentration and toxigenic factor in toxin formation (possibly an indirect one) still awaits discovery.—A. EDEN.

SCHEUBER, J. R. (1944.) **Some remarks on black quarter vaccines.**—*Onderstepoort J. vet. Sci.* **19.** 17–22. **298**

S. investigated the efficacy of blackleg vaccines used in South Africa. These are of two types, the so-called "cultural aggressins", which are bacteria-free filtrates of cultures of *Clostridium chauvoei*, and bacterins, which contain the antigenic substances present in "aggressins", plus killed *Cl. chauvoei* organisms, treated with alum or aluminium hydroxide.

Slight persistent local reactions may occur at the site of inoculation with preparations precipitated with alum or aluminium hydroxide, but such vaccines give marked protection against infection. Even with the best vaccines, the immunity produced diminishes after 6–12 months. There is some loss in the antigenic properties of all vaccines after 6–12 months' storage.—D. L. H.

ADAMS, M. H., & HENDEE, E. D. (1945.) **Methods for the production of the alpha and theta toxins of** *Clostridium welchii*.—*J. Immunol.* **51.** 249–256. **299**

High yields of the α and θ toxins of *Cl. welchii* were obtained from a simplified medium based on a pancreatic digest of casein. The preparation of the medium and the methods used for the concentration and purification of the α toxin are described.—D. W. MENZIES.

HALL, I. C. (1945.) **The occurrence of** *Bacillus botulinus*, **types A and B, in accidental wounds.** —*J. Bact.* **50.** 213–217. **300**

In bacteriological examination of 2,493 wounds, *Clostridium botulinum* Type B was found only once and *Cl. botulinum* Type A only twice. None of the cases developed symptoms of botulism

and all recovered. H. gives clinical bacteriological data concerning these three cases.
—D. W. MENZIES.

RYFF, J. F., & LEE, A. M. (1946.) **The etiology of calf diphtheria.**—*Amer. J. vet. Res.* **7.** 41–44. **301**

Cultures of *Fusiformis necrophorus* and of a variety of secondary organisms isolated from three cases of " calf diphtheria " were inoculated intracutaneously into the upper buccal surface of the lips of rabbits. A strain of *F. necrophorus* which failed to produce lesions in the lip produced abscess formation or superficial necrosis when injected together with cultures of the secondary invaders. When *F. necrophorus* was injected in larger doses or was first passaged, it was capable of producing such lesions alone. All strains of *Staphylococcus aureus* and one strain each of *Staph. albus*, of a corynebacterium and of a yeast-like organism produced buccal lesions without the addition of *F. necrophorus*. Combinations of *F. necrophorus* and a pathogenic secondary invader nearly always produced lip lesions and combinations with saprophytic organisms produced lesions in about half the animals inoculated.

In rabbits on a diet deficient in vitamins (given oats only) there was some evidence that the lesions were more severe than in animals given hay in addition. The plasma level of vitamin A was considerably higher in the latter group. The addition of cod liver oil or ascorbic acid to the deficient diet failed to demonstrate any increased resistance to the infection.—E. G. WHITE.

LESBOUYRIES, G. (1942.) Actinophytose à actinomyces chez les carnivores. [**Actinomyces in carnivora.**]—*Rec. Méd. vét.* **118.** 193–202. **302**

The author briefly reviewed the literature and described the variety of clinical conditions encountered in dogs and cats which can be associated with *Actinomyces* infection. The organisms are varieties of *A. bovis* or *A. israeli*, notwithstanding some differences in cultural and pathogenic features and the absence of club-formation *in vivo*. No direct evidence is given for the assertion that these *Actinomyces* normally lead a saprophytic existence *in vitro*.—M. L. LEVI.

HOERLEIN, A. B. (1945.) **Studies on animal dermatomycoses, I. Clinical studies. II. Cultural studies.**—*Cornell Vet.* **35.** 287–298 & 299–307. **303**

I. A study was made of animal dermatomycoses in central New York. In dogs and cats, the only dermatophyte demonstrated was *Microsporum canis*, a fungus also responsible for about half of the cases of tinea capitis of man in the U.S.A. Infection was found most commonly in kittens and puppies but occasionally appeared in older animals. Dermatomycosis in cattle, mostly calves, was very common in the area examined, particularly in the winter months. In all cases the causative agent was found to be *Trichophyton album*. This fungus is transmissible to man and causes severe lesions which are, however, usually only transient. Only two cases of dermatomycosis of horses were found. In one of these the causative agent was *M. equinum*; the disease was mild, with little scab formation and lesions giving a moth-eaten appearance. In the other the fungus involved was *Trichophyton equinum*; infection was characterized by the appearance of a very thick scab which adhered tightly to the skin and which, when removed, left the skin bare and moist. No data are given regarding treatment of any of the above cases, but all those artificially produced for study purposes recovered spontaneously.

II. The identification of fungus species depends on their gross and microscopic morphology in culture. *M. canis* grows freely in Sabouraud's dextrose agar, small colonies appearing in 2–3 days. *T. album* grows slowly and can only be cultured with difficulty. In Sabouraud's dextrose or maltose agar, minute colonies appear in about two weeks. *M. equinum* is easy to culture: small colonies appear on Sabouraud's dextrose agar in two days, but spore formation, which is necessary for identification purposes, is poor on this medium; rice medium is, therefore, recommended. *T. equinum* grows less readily in culture, but in successful cultures typical small colonies appear in a week on dextrose agar.—D. D. OGILVIE.

See also absts. **473** (staphylococci), **367, 369, 423, 466** (TB.), **367, 369, 371, 466** (brucellosis), **418, 419** (strangles), **371, 424** (*Erysipelothrix*), **425** (tetanus), **414–416, 418, 419** (antibiotics).

DISEASES CAUSED BY PROTOZOAN PARASITES

BURTT, E. (1946.) **The sex ratio of infected flies found in transmission-experiments with *Glossina morsitans* and *Trypanosoma rhodesiense*.**—*Ann. trop. Med. Parasit.* **40.** 74–79. **304**

In *G. morsitans* raised from pupae and fed on animals infected with *T. rhodesiense* a higher infection rate was recorded in the males which survived for examination than in the females. It is suggested, however, that the earlier deaths of females may have resulted in a greater number of infected females being missed.—U. F. R.

STEFANOPOULO, G., CAUBET, P., & DUVOLON, S. (1945.) Méningoencéphalite à *Trypanosoma gambiense* (souche neurotrope) observée chez le

lapin. **[Meningo-encephalitis produced in rabbits by the neurotropic strain of *T. gambiense*.]** —*Bull. Soc. Path. exot.* **38.** 271–274. **305**

After the subcutaneous inoculation of a rabbit with Roubaud's neurotropic "Yaoundé" strain of *T. gambiense* no blood infection developed, but 13 months later paralytic symptoms appeared. On autopsy trypanosomes were detected in lymph nodes and liver and brain material, but not in the blood or in lung smears. Histological examination revealed a patchy meningitis, with perivascular infiltration of the brain cortex. Morula cells of Mott were not detected in brain material, but occurred in preparations from the liver and kidneys.

In the discussion which followed it was pointed out that trypanosomes of the "Yaoundé" strain average 28·4μ in length, against 20–23μ for other strains of *T. gambiense*.—U. F. RICHARDSON.

PELLEGRINI, D. (1942–45.) Il Tripanosoma cazalboui-vivax nel cammello. Infezione naturale e sperimentale. **[Natural and experimental *Trypanosoma vivax* infection in camels.]**—*Racc. Stud. Pat. vet., Somaliland.* No. 1. pp. 12–32. [English summary.] **306**

A case of natural infection of a camel with *T. vivax* came under observation and from this animal the infection spread to three other camels at the research institute and was experimentally inoculated into another four. The infected camels developed a febrile reaction and debility, but only one died. The morphological characters of the trypanosome, which agree with those of *T. vivax*, are given in detail. The organism was also inoculable into ruminants, but not into dogs or small experimental animals, except for one g. pig which developed a fleeting infection. Infection of goats, sheep and cattle was usually fatal. An inoculated mule recovered.

The mercuric chloride test used for *T. evansi* infection in camels gave positive readings in the camels infected with *T. vivax* during the period of blood infection, but became negative again when the trypanosomes disappeared from the peripheral blood.

In view of the absence of tsetse flies from the neighbourhood of the research institute, it is believed that the transmitting agents were tabanids or *Stomoxys*.—U. F. RICHARDSON.

WOOD, S. F. (1944.) **Additional notes on the persistence of *Trypanosoma cruzi* in dead insect vectors.**—*Bull. S. Calif. Acad. Sci.* **42.** 115–127. [Abst. in *Rev. appl. Ent.* Ser. B. **33.** 72–73, copied *verbatim*.] **307**

Details are given of experiments on the persistence of various strains of *Trypanosoma cruzi* in a viable state in nymphs of *Triatoma* spp. after they had died naturally in the laboratory or had been killed or immobilised by exposure to hydrocyanic acid gas. Some treated with the gas survived for many days and could, if stimulated, move legs and antennae, but could not crawl. The longest periods for detection of living stages of the trypanosome after natural death of the bugs were 41 days in *T. protracta*, Uhl., 3 days in *T. protracta woodi*, Usinger, and 24 days in *T. rubida*, Uhl., and the longest periods after death or immobilisation by cyanide were 127 days in *T. protracta*, 122 days in *T. rubida* and 16 days in *T. longipes*, Barber. The author considers that the persistence of *Trypanosoma cruzi* in dead bugs is of importance in maintaining a large rodent reservoir of infection, since rodents acquire infection by feeding on them. They would be particularly likely to notice dying bugs that still moved their antennae or legs.

Some of the bugs in all the cultures used for these experiments were found to be infested by *Ereynetes concolor*, Hald. This mite occurred most often on *Triatoma rubida* from nests of wood rats [*Neotoma*] in Arizona. No trypanosomes were found in mites from infected bugs.

CASSAMAGNAGHI, A., hijo. (1945.) Trichomoniasis aviaria. Primeras observaciones en el Uruguay. **[First reports of avian trichomoniasis in Uruguay.]**—*Bol. mens. Direcc. Ganad., Montevideo.* **28.** 115–137. **308**

C. describes cases of trichomoniasis observed in pigeons, in a Leghorn pullet and in turkeys in Uruguay. In the pigeons are found both the "yellow button" type of lesion, affecting the upper digestive tract, and enterohepatitis, consisting of a haemorrhagic enteritis accompanied by an enlarged friable liver with massive areas of caseation, and focal necrosis of the myocardium. The "yellow button" type is an important, highly infectious disease of young pigeons, but the disease characterized by enterohepatitis does not tend to spread rapidly. In young turkeys, trichomoniasis is often associated with coccidiosis, histomoniasis and helminth infestation. Trichomoniasis in poultry is often associated with vitamin deficiency and with forms of leucosis.

—ISOBEL W. JENNINGS.

STABLER, R. M., & ENGLEY, F. B., Jr. (1946.) **Studies on *Trichomonas gallinae* infections in pigeon squabs.**—*J. Parasit.* **32.** 225–232. **309**

Pigeon squabs, free from *Trichomonas gallinae*, were inoculated orally with a strain of this species which had been isolated from pharyngeal lesions of a peregrine falcon. Inocula with and without bacteria were used and in some experiments the buccal mucous membrane was lightly scarified. The bacteria produced no detectable disturbance,

and had no effect on the extent or severity of the lesions produced by *Trichomonas*. Pure culture of *T. gallinae* placed in the mouths of squabs produced deaths. Lesions, apparent after an average of 7·4 days, took the form of small yellowish areas in the mid-line between the soft palatal flaps in the pharyngeal region of the mouth. The mouth cavity was the most seriously involved. The intestine was not affected. At autopsy, birds which had died of trichomoniasis 10 days after implantation showed the greatest pathological changes in the liver. Areas of necrosis, probably originating as contact extensions of superficial liver lesions, occurred on the surfaces of the small intestine, pancreas, lungs and heart.—C. H. S.

CATCOTT, E. J. (1946.) **The incidence of intestinal protozoa in the dog.**—*J. Amer. vet. med. Ass.* **108.** 34–36. **310**

Coccidia were demonstrated in 10·6% of faecal samples from 113 unselected dogs presented at a veterinary clinic. Twenty of the dogs were infected with the flagellate *Giardia canis*, and about one-third of these dogs had diarrhoea.
—G. B. S. HEATH.

DICKINSON, E. M. (1946.) **A factor in delayed production of *Eimeria tenella* oocysts.**—*Poult. Sci.* **25.** 391–392. **311**

D. presents evidence that production of oocysts is delayed when chickens are inoculated with old cultures of *E. tenella*. Formation of schizonts may also be delayed when the culture used for inoculation is an old one.—G. B. S. H.

NOVICKY, R. (1945.) **Swine coccidiosis in Venezuela.**—*J. Amer. vet. med. Ass.* **107.** 400–403. **312**

Several deaths occurred in swine from coccidiosis and recovered animals continued in poor condition. The coccidium was identified as *Eimeria debliecki*; the oocysts were oval, ovoidal or ellipsoidal in form and the size ranged from 16·5–24μ in length and from 13–18μ in breadth. Most of the affected pigs showed severe diarrhoea with liquid stools varying in colour from greenish to dark brown. There was evidence of conjunctivitis. The pathological findings included general emaciation and severe anaemia. There were serous infiltrations of the subcutaneous tissues of the neck and throat and infiltrations in the thigh muscles, the epicardium and lymph nodes. There was cirrhosis of the liver and swelling of the spleen and mesenteric lymph nodes. The wall of the intestine was thickened and oedematous and the mucous membrane was anaemic, hypertrophic and wrinkled. Small haemorrhages were evident in parts of the mucosa of the small intestine. The mortality among infected pigs was relatively low, but young animals which survived were retarded in growth. Pigs more than one year old had an immunity probably due to an initial moderate infection and further infections during early life.
—C. HORTON SMITH.

DRIEUX, H., THIÉRY, J. P., SALOMON, L., & DOROTTE, G. M. (1944.) Polyadénome nodulaire de l'intestin d'origine coccidienne chez le mouton. **[Multiple coccidial nodules in the intestine of sheep.]**—*Rec. Méd. vét.* **120.** 129–134. **313**

Two observations appear to confirm a previous description of tumours developed in the small intestine as a result of coccidial infestation. Both reproductive phases of the life-cycle are found in the cells of these tumours. The comparative rarity of these tumours, in contrast to the frequent occurrence of ovine coccidiosis, lead the authors to suppose that they may either decrease in size and disappear, or break away and be eliminated in the majority of cases.—C. H. S.

FONSECA, F., CAMBOURNAC, F. J. C., PINTO, M. R., PEREIRA, J. M., & CUNHA, A. (1946.) **Studies on the exo-erythrocytic cycle of malaria.**—*Parasitology.* **37.** 113–117. **314**

The authors demonstrated the possibility of infecting chick embryos by placing sporozoites on the chorio-allantoic membrane or by injecting infected blood into a blood vessel of this membrane, thus affording the possibility of infection with exo-erythrocytic forms by injecting emulsified organs rich in reticulo-endothelial stages. It is considered that the development of the sporozoite is intracellular. The negative phase in human malaria may be due to a primary cycle, which could best be demonstrated by finding reticulo-endothelial forms during the incubation period. It is believed that there is a reticulo-endothelial cycle in human malaria which precedes the erythrocytic phase, but the demonstration of micro- and macroschizonts like those of the avian disease is necessary before proof is complete. Observations show that in the latent period of infection preceding relapse it is possible to find in smears from spleen punctures some non-pigmented intra-cellular forms similar to those found during the incubation period.—C. H. S.

ROUBAUD, E. (1945.) Influence du développement plasmodien sur la fécondité des moustiques hotes. **[Influence of developing plasmodia on the fecundity of the host mosquito.]**—*Bull. Soc. Path. exot.* **38.** 300–304. **315**

From the observations reported it appears that development of the plasmodia may bring about a reduction in the fecundity of the mosquito host. The effects are proportionate to the degree of parasitism and may thus tend to reduce

the numbers of the transmitting agents and limit the progress of human and animal infections.
—C. Horton Smith.

Carlson, H. J., Mueller, M. G., & Bissell, H. D. (1946.) **Colorimetric diagnostic test for malaria.**—*J. Lab. clin. Med.* **31.** 677-686. [Authors' summary copied *verbatim.*] **316**

A dye-protein test involving the use of Congo red, quinine hydrochloride, and serum has been described in which it is possible to detect serum changes in malarial infections. Observations on experimental and human infections lead one to believe that the test could be utilized as a diagnostic test for latent infections. The technique of the test is not presented as a definitive procedure but rather as one that has sufficient promise to warrant further exploration.

Schüffner, W., & Bohlander, H. (1942.) Schlammfieber in Holland—die Feldmaus als Träger. [**" Mud fever " in Holland—the vole as a carrier.**]—*Zbl. Bakt. I.* (*Orig.*) **148.** [No. 6.] 264–273. [Abst. from authors' summary.] **317**

The first confirmed outbreak of " mud fever " in the Rhine delta at Arnhem and Nijmegen is described. Cases were confined entirely to children 10–13 years old, who had been engaged in catching field mice, *Microtus arvalis arvalis.* Of 14 children, 10 developed the disease. The causal organism, *Leptospira grippo-typhosa*, was found in the blood and urine of the affected children, and was sometimes very numerous in the kidneys of the field mice, 27 being infected among 53 examined.

The suggestion is made that the field mouse may be involved also in the great infection centres of Schleswig, the Volga Basin and Bavaria, and that " mud fever " may thus not be primarily a soil infection.

Schüffner, W., & Bohlander, H. (1942.) Die Feldmaus (Microtus arvalis arvalis) als Träger des Schlammfiebers (syn. Ernte-, Wasser-, Feldfieber). Ergänzung zu unserer Arbeit in Bd.148, S.263, 1942. [**The field mouse as reservoir of leptospirosis (mud fever).**]—*Zbl. Bakt. I.* (*Orig.*). **149.** 358–362. [See also preceding abst.] **318**

The detection of leptospiral infection in voles is recorded at Regensburg on the Danube, another centre of human " mud fever " [*Leptospira grippo-typhosa* infection]. The absence of " mud fever " in certain areas of Holland, which has been advanced as evidence that field mice are not involved, is explained by the absence of mouse infection in these areas. Further study of the biology of field mice is called for.—U. F. R.

Anon. (1946.) **An observation of dogs transmitting leptospirosis to their masters.**—*J. Amer. vet. med. Ass.* **108.** 166–167. **319**

A man and his wife, owners of four dogs, fell ill within a fortnight of each other, one with influenza-like symptoms, nervous excitement and mulberry-like eruptions, and the other with symptoms of pulmonary hyperaemia. Leptospirosis being suspected, agglutination tests were carried out: readings were positive for both *Leptospira icterohaemorrhagiae* and *L. canicola*, the higher readings being given for *L. canicola.* Although the four dogs appeared to be in good health they gave strongly positive readings to aggln. tests for *L. canicola*, and leptospira were found by centrifugation in the urine from three of them. It is suggested that the act of parturition in the bitch had activated leptospirosis, which was transmitted to the puppies and from them to the owners by fondling. Another lady who bought one of the puppies contracted infection a month later.

It is suggested that leptospirosis resembles brucellosis in that massive infection with the organism is compatible with health in the natural host, but may prove the source of human disease.
—U. F. Richardson.

I. Witte, J. (1943.) Spirochätenartige Gebilde im Blut von gesundem und krankem Geflügel sowie anderer Tierarten. [**Spirochaete-like bodies in the blood of healthy and diseased birds and animals.**]—*Dtsch. tierärztl. Wschr.* **51.** 45–46. **320**

II. Wirth, D. (1943.) Spirochätenartige Gebilde im Blut. [**Spirochaete-like bodies in blood.**]—*Ibid.* 135. **321**

I. Under war conditions several outbreaks of poultry diseases were recorded in Germany, originating from imported birds or carcasses. These included fowl plague (introduced by Hungarian pheasants), infections laryngo-tracheitis and spirochaetosis.

In routine dark-ground examination for spirochaetes, threads were encountered in blood preparations which varied in thickness from the limits of visibility to $0{\cdot}5\mu$, and in length from 2–3 times that of red corpuscles. These threads had no true motility, but might be mistaken for spirochaetes owing to passive movement in currents in the fluid preparations. All attempts to stain them failed. Similar threads were observed in the blood of g. pigs, mice, rabbits and dogs and it is considered that these non-specific threads have at times been mistaken for spirochaetes.

II. Wirth points out that the threads

described in I were evidently identical with those described by him as "blood threads" and which he had encountered in work on canine leptospirosis. They had previously been described in medical literature under the names "pseudo-spirochaetes" or "carcass spirochaetes", but their nature or origin had not been determined.

To this article a note is added by WITTE that he does not consider the name "blood threads" as happily chosen, as they may occur in the absence of blood, *e.g.*, in brain tissue. He suggests that until more is known as to their nature it would be best to retain the name "pseudo-spirochaetes".—U. F. RICHARDSON.

See also absts. **426**, **427** (trypanosomes), **428** (coccidia), **429–431** (plasmodia), **416** (spirochaetes).

DISEASES CAUSED BY VIRUSES AND RICKETTSIA

BELLER, K. (1943.) Filtration und filtrierbare Virusarten. **[Filtration and filtrable viruses.]** —*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 115. **322**

A review of research on filtrable viruses.

—W. M. HENDERSON.

DOBBERSTEIN, J. (1944.) Der Zerlegungsbefund bei der Maul- und Klauenseuche unter Berücksichtigung der Frage der Entschädigung. **[Compensation in outbreaks of foot and mouth disease.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Sept. 29th. 315–317. **323**

In Germany (1944) compensation for deaths among cattle during outbreaks of F. & M. disease was paid only when death could be attributed directly to the action of the virus, no claim for compensation being admissible for death due to sequelae of the disease. Clinical differentiation between the virus disease and its sequelae is not always easy and D. gives a brief description of the possibly fatal conditions which can be classified as caused by action of the virus, *viz*, virus septicaemia, in which death occurs in the first days of the illness, the well-recognized diffuse degenerative changes of the myocardium, pododermatitis aphthosa, which should be distinguished from pododermatitis gangrenosa, laryngitis aphthosa and pharyngitis aphthosa.—W. M. HENDERSON.

PYL, G., & HOBOHM, K. O. (1944.) Zur Kenntnis der Zusätze nichtbiologischer Herkunft in der Riemser Maul- und Klauenseuche-Vakzine. **[The non-biological constituents of the Riems foot and mouth disease vaccine.]**—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* February 18th. 56–58. **324**

This is a discussion of the effect of aluminium hydroxide, formalin and glycocoll buffer on the antigenicity and stability of the Riems vaccine.

If the vaccine becomes frozen during storage its effectiveness is lost and there is a noticeable change in the character of the aluminium hydroxide suspension. Originally this is fine and milky, but on freezing, large floccules are formed that quickly sink to the bottom. There is apparently no fundamental alteration in structure and the antigenicity can be regained by fine division of the frozen material as, for example, after treatment in a colloid mill. It is suggested that freezing causes aggregation of the suspended particles and so reduces the free surface carrying adsorbed antigen. This view is confirmed by the fact that rapid freezing at –80°C. with little aggregation has only a slightly deleterious effect.

The complete action of the formaldehyde is not known but on analogy with its action on tobacco mosaic virus the aldehyde may unite with the amino group of the virus. In the case of tobacco mosaic virus this reaction is reversible, whereas reversibility has not been demonstrated with F. & M. disease virus in the vaccine, the assumption being that it is prevented by treatment in the presence of aluminium hydroxide. A fixed concentration of formalin is necessary, since both antigenicity and infectivity are lost if the optimum amount of 0·05% is exceeded.

The formation of methylene glycocoll by the interaction of the formaldehyde and the glycocoll buffer is important from the point of view of deterioration during storage. Methylene glycocoll dissociates into its component parts with warming and once inactivation of the virus has taken place at the temperature of 25°C. used in the preparation of the vaccine, the temperature of the vaccine should be reduced to and maintained at +2° to +7°C. At this temperature dissociation of methylene glycocoll does not take place and the antigen is saved from the possibly deleterious effect of further exposure to free formaldehyde.

—W. M. HENDERSON.

*GROGG, A. (1942.) Der Maul- und Klauenseuchezug 1937/39 in der Schweiz. **[Foot and mouth disease in Switzerland in the years 1937-39.]**—*Inaug. Diss., Berne.* pp. 63. [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **84.** 424–426. **325**

The effect of the 1937–39 European epidemic of F. & M. disease on Switzerland is described. It was responsible for the worst series of outbreaks that had occurred in the country since 1919–21. The normal policy of slaughtering affected animals was no longer sufficient to keep the disease in check and rapid spread occurred up to the middle of

December, 1938, after which the number of new outbreaks diminished rapidly. The foremost measure taken to combat the disease was slaughter of affected stock, followed by disinfection of premises and inoculation of animals exposed to infection with either convalescent serum, hyperimmune serum, aluminium hydroxide vaccine or crystal violet vaccine. G. is sceptical about the value of vaccination in this outbreak, as the frequency of new cases had already begun to diminish by the time vaccination was introduced. Altogether of 62,685 animals with a value of over 35 million francs were slaughtered.—W. M. H.

*Schükrü-Aksel, I. (1938.) Sur la nature des corpuscules de Negri. [**The nature of Negri bodies.**]—*Anal. Inst. Victor Babes, Bucarest.* **9.** 205–211. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 96.] **326**

Using special fixation and staining techniques, the author concludes that the Negri bodies in rabies do not represent any sort of protozoa. In all probability they are special products of the rabies virus in the ganglion cells.—J. Zweig.

*Westermarck, H. (1944.) [**" Liver and brain disease " of horses in Finland in 1942.**]—*Suom. Eläinlääkäril.* No. 2. p. 35. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Sept. 15th. 299. (1944).] **327**

The original article contains a description of 32 cases of hepato-encephalitis, a disease of unknown aetiology that has been reported in horses in Finland. The disease resembles the encephalitis of horses seen in Russia but W. apparently considers that the two conditions are distinct and mentions that the Finnish form cannot be transmitted to experimental animals. The abstract does not give a description of the clinical signs or the pathology of the disease, but states that diagnosis can be established only by examination of liver material obtained by liver puncture. The mortality of the disease is stated to be 86% and it is suggested that it may be due to a virus infection. [See also *V. B.* **12.** 422, 458, and **14.** 342.]—W. M. Henderson.

Stein, C. D., Osteen, O. L., Mott, L. O., & Shahan, M. S. (1944.) **Experimental transmission of equine infectious anaemia by contact and body secretions and excretions.**—*Vet. Med.* **39.** 46–52. **328**

This paper contains a comprehensive review of the literature on the transmission of E.I.A., 34 references being cited. Attempts to transmit the disease to susceptible horses by the subcutaneous administration of filtered saliva, filtered and unfiltered urine and the oral administration of unfiltered saliva and unfiltered urine collected from acute, subacute and chronic cases were unsuccessful. No transmission of the disease occurred by ordinary stable contact during an exposure period of 5–14 months, or by semi-intimate contact (eating and drinking out of the same containers as infected horses) for six months. One out of three animals contracted the disease during eight months' intimate contact with eleven horses and mules affected with all forms of the disease allowed free range in a large stable. All the openings in the buildings used for the experiments were screened to exclude flies and mosquitoes.—W. M. Henderson.

Martin, L. A. (1946.) L'anémie infectieuse des équidés. V.—Passages accélérés du virus par un organisme sensible. [**Equine infectious anaemia. V. Rapid passage of virus.**]—*Ann. Inst. Pasteur.* **72.** 489–491. [For previous parts, see *V. B.* **15.** 322.] **329**

As it had been shown that the virus of E.I.A. was present in the blood of an animal three days after inoculation although the clinical incubation period might be much more prolonged, an attempt was made to shorten the period by subinoculation in series every three days. No shortening of the incubation period resulted, but from a small number of experiments it was indicated that after the fifth passage of the three-day virus the ability to survive for long periods *in vitro* was lost and the virulence was reduced, so that immunity might be conferred without the production of any clinical response. [This last indication rests on the failure to react and subsequent immunity of only two animals.]—U. F. Richardson.

Oppermann, T. (1943.) Der Wert des Tierversuches für die Diagnose der ansteckenden Blutarmut der Einhufer. [**The value of inoculation tests on animals other than horses, for the diagnosis of equine infectious anaemia.**]—*Dtsch. tierärztl. Wschr.* **51.** 21–26. **330**

A brief survey of the literature reveals the essential points required in experimental animals for E.I.A. studies, and that it is not practical to use horses for large-scale testing, since blood transmission tests indicate only positive infection.

Infection experiments with pigs, sheep, rabbits, g. pigs, hens and pigeons were unsatisfactory in the case of the pig, sheep and rabbit. However, a simplified technique could be applied to rabbits.

1.0 ml. of horse serum was injected into two healthy rabbits with a normal blood picture, followed three days later by 2–3 ml. of a freshly prepared 1% alcoholic solution of phenylhydrazine. The rabbits were killed 4–5 days after the phenylhydrazine injection. The test was positive if the liver had more or less pronounced haemo-

siderosis and cell proliferation. G. pigs rendered more sensitive by phenylhydrazine (0·75–1·0 ml. of a 1% solution) were also suitable, but less so than rabbits. Evidence regarding the sensitivity of hens and pigeons was conflicting as dietary factors must be considered.—K. J. SINCLAIR.

JACQUET, J., & DOURNEL, J. (1944.) Aspect épidémiologique de l'encéphalomyélite du cheval dans le département de la Manche. [**The epidemiology of equine encephalomyelitis in the French department of la Manche.**]—*Bull. Acad. vét. Fr.* **17.** 165–171. **331**

An account is given of a serious outbreak of E.E. which commenced in 1941. The disease had a seasonal incidence, most cases arising in the late summer, particularly in September; outbreaks contiguous to the main centres of infection were liable to occur about six weeks later. Up to the present, attempts to recover a virus from these cases have been unsuccessful.—R. E. GLOVER.

LIGHT, J. S., & HODES, H. L. (1943.) **Studies on epidemic diarrhea of the new-born: isolation of a filtrable agent causing diarrhea in calves.**—*Amer. J. publ. Hlth.* **33.** 1451–1454. **332**

In six separate epidemics of diarrhoea in new-born babies in Baltimore and Washington, stool cultures were uniformly negative for pathogenic bacteria. A search for a possible filtrable virus was made by inoculating stools, blood and nasal washings into a variety of small animals with negative results.

Stools from four epidemics, Seitz-filtered in three instances and unfiltered in one, were given intranasally to calves. In all four cases the inoculated calf developed a bloody mucoid diarrhoea and serial passage to other calves was effected. The disease was reproduced in a total of 84 calves, varying in age from two days to two months, most of them 1–3 weeks old. The minimum infecting dose of infected calf faeces in saline suspension was 1·0 ml. with unfiltered and 8·0 ml. with filtered material. The incubation period varied from two to five days. The clinical symptoms in the calves were uniform, being characterized by diarrhoea with large amounts of mucus; blood was usually present at some time during the course of the disease. Systemic reaction was slight and there was very little rise of temperature. There was a marked tendency to relapses, the total duration of illness being 8–54 days. The mortality was about 13%. Recovery was followed by immunity to reinfection. Lesions consisted of hyperaemia of the mucous membrane of the small and large intestines and enlargement of mesenteric lymph nodes. In one severe case ulceration of the intestinal mucous membrane was present. Two out of three attempts to transmit infection by inoculation of blood were successful. Susceptible calves were also infected by contact. It was not possible to isolate the infective agent from the faeces of healthy calves or babies. It is not known whether this agent is responsible for naturally occurring outbreaks of diarrhoea in calves. [See also *V. B.* **16.** 112—report of the Medical Research Council of Ireland.]—M. C.

ROLLE & ROEMMELE. (1943.) Infektiöse Bronchitis und Bronchopneumonie des Rindes. [**Infectious bronchitis and broncho-pneumonia in cattle.**]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 181–183. **333**

The disease described occurred among a large shipment of cattle sent from Holland to Riga. Many died on board ship, more in quarantine on arrival and a few on their farms of destination where they spread the disease to indigenous animals.

The clinical course was one of acute bronchopneumonia, with high fever, rapid pulse, painful cough and distressed breathing. Fairly rapid recovery or death within a month might occur. The appearance of the lungs P.M. resembled that of bovine contagious pleuro-pneumonia, but the interstitial exudation was less pronounced. There were petechiae on the endocardium and epicardium and the heart muscle was soft and fragile (as if cooked). The mediastinal lymph nodes were swollen. Histological examination revealed the severe necrotizing effect of the disease on the alveoli and smallest bronchioles. Six cases were examined bacteriologically and a non-pathogenic bipolar-staining organism was isolated: it was not a pasteurella.

Attempts to transmit the disease to cattle and horses by means of fresh lung exudate were not very successful. One bovine out of 5 bovines and 1 horse infected intranasally reacted by an acute fever of short duration; five others and horses exposed in various ways did not react.

The authors concluded that although clinically more severe the disease was possibly identical with the infectious bronchitis of cattle described in 1935 by WALDMANN & KÖBE [*V. B.* **5.** 490].
—J. E.

WILSON, D. R. (1945.) **Studies in louping-ill. I. Cultivation of louping-ill virus *in vitro*. II. Pathogenic properties of culture virus.**—*J. comp. Path.* **55.** 250–267. **334**

The object of W.'s work was the cultivation of louping ill virus *in vitro* in quantities sufficient to warrant study of the antigenic and immunizing value of culture virus, and the investigation of its pathogenic properties.

The optimum pH of Tyrode's solution was

7–9 and embryonic tissue was taken from eggs which had been incubated 9–11 days. Cultures of 50 ml. volume and 2,000–14,000 ml. were used: these proved equally good and yielded massive amounts of virus. Virus titres appear to be dependent, to a large extent, on the ratio of tissue to fluid in the flasks, the optimum falling between 1 : 100 and 1 : 33. Virus survives in cultures for periods up to 99 days when stored at 0°–4°C. In sheep, intracerebral inoculation of 1.0 ml. whole culture virus produced an initial pyrexia, followed by typical louping ill in 5–6 days. At a dilution of 10^{-4}, inoculated subcutaneously into ten sheep, it produced the initial rise in temperature, but not the nervous syndrome; virus was not detected in the blood stream of two of these sheep. A solid immunity to subsequent infection with louping ill virus was demonstrated in the sheep which had been inoculated subsutaneously.

—G. B. S. HEATH.

CSONTOS, J. (1943.) Seuchenhafte ansteckende Herzmuskel- und Skelettmuskelentartung der Lämmer. [**Infectious degeneration of heart and skeletal muscle in lambs.**]—*Dtsch. tierärztl. Wschr.* **51.** 121–124. **335**

C. investigated an outbreak of this disease and found that in some lambs, in addition to the degenerative lesions of the heart and muscles reported by earlier workers, there were brain lesions, with hyperaemic meninges and perivascular infiltrations. Bacteria-free material from the blood and brain of diseased lambs set up the disease in experimental stock; the latter, in turn, infected susceptible stock by natural methods. There was evidence that the disease was caused by a virus with myotropic and neurotropic tendencies. Further work is necessary to discover the influence of environmental factors on an outbreak of the disease in a flock, and the natural host of the virus and its relationship to other viruses.

—R. A. ROPER.

CHELLE, P. L. (1942.) Un cas de tremblante chez la chèvre. [**A case of scrapie in a goat.**]—*Bull. Acad. vét. Fr.* **15.** 294–295. **336**

A goat born of healthy parents was kept with a flock of sheep in which many cases of scrapie were occurring. It had no symptoms of the disease until two years of age, when it developed characteristic signs, *viz*, extreme lumbar pruritus, incoordination, etc. It is considered that infection was acquired from the sheep and probably arose at an early age.—R. E. GLOVER.

BERTHELON, M. (1942.) La grippe du porc. [**Swine influenza.**]—*Rec. Méd. vét.* **118.** 257–269. **337**

A review containing no new observations or record of original work.—R. E. GLOVER.

COLE, C. G., HENLEY, R. R., & HUBBARD, E. D. (1946.) **Concentration of hog-cholera virus in the blood of artificially infected swine at different stages of the disease.**—*J. Amer. vet. med. Ass.* **108.** 143–147. **338**

Experiments were carried out to ascertain the amount of swine fever virus in the blood of artificially infected pigs on successive days following inoculation. Serial dilutions of the blood ranging from 1 : 25,000 to 1 ; 10,000,000 ml. were injected in 5 ml. doses into each of two susceptible pigs.

The results were as follows:– third day, 1 : 25,000 + and 1 : 250,000 –; fourth day, 1 : 250,000 + and 1 : 750,000 –; fifth day (results irregular), 1 : 250,000 and 1 : 5,000,000 +, 1 : 1,000,000, 1 : 2,500,000 and 1 : 10,000,000 –; sixth day, 1 : 1,000,000 + (higher dilutions not tested); seventh day, 1 : 1,000,000 +, 1 : 2,500,000 ±, 1 : 5,000,000 –; ninth day (results irregular), in one series 1 : 1,000,000 ±, but in another 1 : 250,000 –.

It follows that the virus content of the blood is at its highest on the sixth to eighth day inclusive.—R. E. GLOVER.

GORET, P. (1946.) Adsorption du virus de la maladie de Carré sur hydroxyde d'aluminium. Action sur le complexe de la dessiccation après congélation. [**Adsorption of distemper virus on aluminium hydroxide and effects of freeze drying.**]—*Ann. Inst. Pasteur.* **72.** 53–57. **339**

A ferret-adapted canine strain of distemper virus was adsorbed on aluminium hydroxide in aqueous suspension. The adsorbed virus was found to be still capable of infecting ferrets on subcutaneous inoculation. The preparation was then freeze-dried and reconstituted in water and was found to be avirulent. There is no loss of virulence if unadsorbed virus is dried in the same manner. G. anticipates that this inactivated adsorbed virus will produce a solid immunity in the ferret: results of further work on the problem are to be published. [This inactivation of adsorbed virus following freeze-drying is similar to that reported by PYL *et al.*—*V. B.* **14.** 231—following freezing of foot and mouth disease virus adsorbed on aluminium hydroxide.]—W. M. HENDERSON.

*PAGNINI, U. (1942.) Ricerche sulla virulenza per varie specie di uccelli viventi in libertà dell'agente causale della dominante moria del nostro pollame. [**Virulence of the causal agent of the current fowl disease for certain wild birds.**]—*Azione vet.* **11.** 281–285. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 148.] **340**

A virus isolated from fowls affected during an outbreak of an undiagnosed disease reproduced the condition in sparrows, goldfinches, finches and

siskins—these birds dying in 7–14 days. Material obtained from one autopsy infected a pigeon. As a result of these experiments the disease is considered to be Newcastle disease.—J. ZWEIG.

I. *GRANELLI, G. (1942.) Sulla attuale moria del pollame, osservata nella zona parmense. Rilievi clinici e isto-patologici. [**Deaths of poultry in the Parma region.**]—*Clin. vet., Milano.* **65.** 267–281. **341**

II. *BARBONI, E. (1942.) Le alterazioni dell' encefalo nei polli morti per la " epizoozia 1940". [**Brain lesions in the " 1940 epizootic " in fowls.**]—*Ibid.* 282–290. **342**
[Absts. from absts. in *Jber. Vet.-Med.* **71.** 235 & 147.]

I. The exact nature of an epizootic in fowls diagnosed as laryngotracheitis or fowl plague or Newcastle disease, etc., remains unsolved. Fowls, turkeys, and pheasants were susceptible, but not geese, ducks or pigeons. The virus was filtrable (Berkefeld W), with an incubation period of 5–45 days. The course was acute, subacute, or subchronic and was characterized clinically by dyspnoea, fever and cyanosis of comb and wattles; subchronic cases were characterized by nervous disorders. The P.M. findings included a sero-haemorrhagic and fibrinous tracheitis, laryngitis, bronchitis, congestion of lungs and liver, haemorrhages of the serous membranes, fibrinous pericarditis and catarrhal inflammation of the stomach and duodenum. The histological examination of nervous tissues revealed only interstitial oedema and light perivascular infiltration.

II. B. examined histologically the brains of 50 fowls, ten of which had had nervous symptoms, and all of which died in the 1940 epizootic. There were no macroscopical lesions but histologically round cell infiltration with minor degeneration of glia cells was seen; in cases with clinical nervous symptoms, a proliferation of the microglia was present. In view of these lesions B. classified the disease in the " pest group ".—J. ZWEIG.

RIDENOUR, G. M., & INGOLS, R. S. (1946.) **Inactivation of poliomyelitis virus by " free " chlorine.**—*Amer. J. publ. Hlth.* **36.** 639–644. [Authors' summary and conclusions copied *verbatim.*] **343**

In contrast to previous studies, this investigation shows that chlorine is an effective inactivating agent for the Lansing strain of poliomyelitis virus if related to the actual " free " or uncombined chlorine residual in solution. Previous work has been related to inactivation by the total available residual chlorine in the medium, which may carry oxidation potentials from just above that of orthotolidine to that of " free " chlorine, depending on the proportions of each. Such a heterogeneous mixture of chlorine and chloro-compounds would logically show, by tests for total chlorine, varying requirement with respect to amounts of chlorine residuals and contact periods for inactivation of the virus. If, however, the inactivation is related to the oxidation potential equivalent to that of free chlorine, a relatively small residual and a relatively short time of contact are needed. On this basis the effect of chlorine on inactivation of the virus is shown to be as follows:

1. A " free " chlorine residual of approximately 0·2 p.p.m., by OTA, will inactivate a 1 : 500 dilution of the virus after a period of 10 minute contact. With a 30 minute contact, approximately 0·1 p.p.m. is required. Results of investigation by the authors, yet unpublished, on a pure culture of *B. coli* show the same degree of tolerance.

2. The amounts of " free " chlorine needed for inactivation are well within the range of practical dosages used in water treatment and swimming pool sanitation, when " break point " chlorination is employed. However, these " free " chlorine residuals may be reached even before the " break ", in which case carrying the disinfection to the " break point " may not be required for inactivation provided the required " free " residual is present before that point is reached.

3. It appears that the effectiveness of the " free " chlorine residual is independent of the type of chlorine-bearing compound as long as the equivalent oxidation potential of " free " chlorine exists. In these studies the results were approximately the same with chlorine, chlorine dioxide, or a mixture of the two, provided the material added was sufficient to give the required OTA residual. There was a slight tendency in favour of the chlorine dioxide OTA residual, but this was not outside the range of experimental error. Hence, it appears that the oxidation potential of the disinfectant system is a fundamental factor in the inactivation. This seems to be substantiated by the fact that ozone studies, while not shown in the data in this paper, show that an ozone concentration equivalent to 0·1 p.p.m. of free chlorine will also effectively inactivate the virus of poliomyelitis.

LICHSTEIN, H. C., MCCALL, K. B., ELVEHJEM, C. A., & CLARK, P. F. (1946.) **The influence of " folic acid " deficiency in** *Macaca mulatta* **on susceptibility to experimental poliomyelitis.** —*J. Bact.* **52.** 105–110. [Authors' conclusions copied *verbatim.*] **344**

The results of these experiments indicate that the rhesus monkey, when deficient in " folic acid ", exhibits an increased resistance to poliomyelitis

virus when the deficiency is of a chronic nature, but not when the deficiency is of the acute type.

HAVENS, W. P., Jr. (1946.) **Period of infectivity of patients with homologous serum jaundice and route of infection in this disease.**—*J. exp. Med.* **83.** 441–447. [Author's summary copied *verbatim.*] **345**

Pooled specimens of serum obtained from 3 human volunteers three-fourths through their respective 56, 66, and 70 day incubation periods of homologous serum jaundice produced the disease in 1 out of 4 human volunteers following parenteral inoculation. Serum specimens obtained from these same 3 patients during the acute, pre-icteric phase of their homologous serum jaundice produced the disease in 3 out of 4 human volunteers following parenteral inoculation. These same sera, proven to be infectious by parenteral inoculation, failed to produce disease when ingested by 10 other human volunteers. Pooled specimens of serum obtained in the convalescent phase (28 to 32 days after onset) of these 3 patients failed to produce apparent infection when inoculated parenterally into 5 human volunteers.

Pooled specimens of feces of 3 patients obtained in the acute phase of homologous serum jaundice, when virus was proven to be in the serum, were not demonstrably infectious when fed to 6 volunteers.

These findings are slightly different from those encountered in a similar study with infectious material from cases of infectious hepatitis.

ANON. (1946.) **Identification and characteristics of the Balkan grippe strain of *Rickettsia burneti*.**—*Amer. J. Hyg.* **44.** 110–122. [Summary copied *verbatim.*] **346**

The "agent of Balkan grippe," obtained from Doctor J. Caminopetros in Athens, Greece, has been identified as a strain of *Rickettsia burneti.* It caused fever in guinea pigs and grew well in embryonated hen's eggs. The organism was a minute, pleomorphic rod. Intracellular inclusions consisting of masses of the organisms appeared in the organs of infected mice.

Agglutination tests with an antigen prepared from the Balkan grippe strain of *R. burneti* were used in studies of sera from outbreaks of Q fever, and proved to be of value for the serological diagnosis of this disease.

MALBRANT. (1945.) Conjonctivite rickettsienne du chien au Congo Français. [**Rickettsial conjunctivitis of dogs in French Congo.**]—*Bull. Soc. Path. exot.* **38.** 251–252. **347**

M. records the detection of rickettsia in cases of canine conjunctivitis at Brazzaville in the French Congo. Smears required prolonged examination for the organisms were scanty. They occurred as large initial bodies which divided to form granular or angular bodies; these in turn divided to form elementary bodies on the limits of visibility. Clinically infected dogs developed severe conjunctivitis which sometimes developed to keratitis, but readily yielded to treatment. As several dogs were attacked at the same time in the same area the infection was thought to be contagious. The name *Rickettsia donatieni* is proposed.—U. F. R.

See also absts. **367**, **371** (swine fever), **372** (piglet influenza), **432** (influenza).

IMMUNITY

HARRIS, T. N., & EHRICH, W. E. (1946.) **The fate of injected particulate antigens in relation to the formation of antibodies.**—*J. exp. Med.* **84.** 157–165. [Authors' summary copied *verbatim.*] **348**

Earlier studies have shown that the injection of antigenic material into the pad of the rabbit's foot is followed by the appearance of antibodies in the regional lymph node, in lymph coming from that node, and especially in the lymphocytes present in such efferent lymph. In the present work the fate of particulate antigenic material has been investigated during the period between its injection into the foot of the rabbit and the appearance of antibodies in the regional lymphatic tissue.

It has been found that soluble substance of the same immunologic specificity as the antigenic material injected can be identified in extracts of the injected tissue and of the regional lymph node, and in the efferent lymph from that node. The concentration of this soluble material falls off slowly in the injected tissue in the course of a few days following the injection. It falls off quickly in the extract of the lymph node and in the lymph itself, and its disappearance is succeeded by the appearance of antibody. Evidence is presented that the immunologically active substance is derived from the injected antigenic material by a physiologic process, and this process is discussed as the means by which antigens, originally comprised in cells, are made available to the lymphocyte.

RAMON, G. (1942.) Sur les bases essentielles de certaines méthodes modernes d'immunisation. Le principe des anatoxines et celui des facteurs adjuvants de l'immunité et leurs applications. [**Basic principles of certain methods of immunization. Anatoxins and adjuvants.**]—*Bull. Acad. vét. Fr.* **15.** 29–42. **349**

R. gives a resumé of his own work as an introduction to a series of articles in the same volume on the prophylaxis of a number of diseases, *viz*, tetanus, staphylococcal infections, etc.

—R. E. GLOVER.

FAVORITE, G. O., & MORGAN, H. R. (1946.) **Therapeutic induction of fever and leucocytosis using a purified typhoid pyrogen.**—*J. Lab. clin. Med.* **31.** 672–676. [Authors' summary copied *verbatim.* **350**

A pyrogenic somatic antigen has been isolated from cultures of *E. typhosa* which induces a febrile response in man when administered intravenously. A fever of from 103 to 105°F. follows doses of from 0·001 to 0·002 mg. To obtain similar results with subsequent injections, the amount of the pyrogen must be increased by three- to fivefold.

Agranulocytic leucocytosis, with large numbers of nonfilament type of cells, accompanies and follows the febrile response.

When a given preparation of the pyrogen is standardized and stored in the refrigerator, it retains its potency for at least five years.

KOBOZIEFF, N., & POMRIASKINSKY-KOBOZIEFF, N. A. (1942.) Génétique et immunité. **[Genetics and immunity.]**—*Rec. Méd. vét.* **118.** 209–217. **351**

The authors record experiments by other workers which indicate that natural immunity to a specific pathogen may be an hereditary factor, the resistance of a strain to a pathogenic organism often depending on a dominant gene. Many examples in the various laboratory and domestic animals are quoted.

Immunity acquired by vaccination, on the other hand, cannot be shown to pass hereditarily from one generation to another. The experiment of METALNIKOV (1924), who thought he had demonstrated the hereditary transmission of acquired immunity in insects, is recorded.

The authors conclude that selection is the only rational method of breeding animals resistant to a certain disease.—R. R. A. COOMBS.

See also absts. **268** (streptococcal immunity), **270** (pneumococcal antigens), **280** (immunogenic units in TB.), **283** (enzymes in TB.), **284** (BCG vaccine), **298** (blackleg vaccine), **324** (foot and mouth disease vaccine), **339** (canine distemper adsorbed vaccine), **391** (protein metabolism and immunity).

PARASITES IN RELATION TO DISEASE [GENERAL]

DIKMANS, G. (1945.) **Check list of the internal and external animal parasites of domestic animals in North America.**—*Amer. J. vet. Res.* **6.** 211–241. **352**

It was recommended by the Committee on Parasitology of the American Veterinary Medical Association, in its annual report for 1943, that the Bureau of Animal Industry of the U.S. Department of Agriculture be requested to publish a bulletin or series of bulletins containing specified information about the parasites of domestic animals occurring in the U.S.A. As a result, D. has compiled this check-list and attempted to comply with most of the points in the Committee's recommendation. The various protozoan, helminth, and arthropod parasites occurring in the U.S.A. and its possessions and in Canada are tabulated as internal or external parasites under the following hosts: horses, mules and asses; cattle; pigs; sheep and goats; dogs and cats; and birds, including chickens, turkeys, guinea fowl, ducks, geese and pigeons. In all, there are 12 tables and in them the following information, where known, is recorded for each parasite: group and common name, scientific name, location in host, intermediate host, and geographical distribution. D. points out that the most unsatisfactory part of the check-list is the geographical distribution of the various parasites since accurate information about this is still incomplete; this particularly applies to the nematode parasites of equines and to the mange mites in general.

—J. N. OLDHAM.

PARASITES IN RELATION TO DISEASE [ARTHROPODS]

HASEMAN, L. (1946.) **Influence of soil minerals on insects.**—*J. econ. Ent.* **39.** 8–11. **353**

As with the higher animals, each insect has its specific nutritional requirement for optimum development and reproduction. There is experimental evidence to show that insects generally require less minerals and that they thrive best when certain elements are in short supply, so that lowering the total level of soil minerals through overcropping, erosion and faulty crop rotation creates improved conditions for insect pests. It is probable that these conditions are responsible for the present increase and spread of insect pests, even though improvements in chemical control measures are being made. These considerations make it even more imperative that greater attention be paid to balanced manuring, soil conservation and improved husbandry.—W. MOORE.

MACARTHUR, W. P. (1946.) **Habituation of *Pulex irritans* to animal host. [Correspond-**

ence.]—*Trans. R. Soc. trop. Med. Hyg.* **39.** 343–344. **354**

The author recovered over 100 *Pulex irritans* (but no *Ctenocephalus*) from his dog and although he was in frequent close contact with the animal no fleas bit him. He suggests that they may have become habituated to dog's blood. He was, however, bitten by hungry fleas in a vacant room initially infested from the dog and explains this as the attacks of newly emerged adults which were not yet fixed in their food preferences. In two cases in other dogs, *P. irritans* was found greatly to exceed the population of *Ctenocephalus*.

[Fleas do not exhibit strict host specificity and the human flea, *P. irritans*, is the usual species found on pigs.]—T. SPENCE.

ABBOTT, K. H. (1943.) **Tick paralysis: a review.**—*Proc. Mayo Clin.* **18.** 39–45 & 59–64. Discussion pp. 62–63. **355**

Tick paralysis is known to affect human beings, colts, calves, sheep, pigs, dogs, cats, rabbits and grouse, symptoms being most marked in young individuals, and follows the bite of *Dermacentor*, *Haemaphysalis*, *Ixodes* and possibly also *Boophilus*, *Rhipicephalus* and *Hyalomma*.

A. reviews the geographic distribution and seasonal occurrence of these ticks and traces the history of the disease, from its first recording in sheep and cattle in Australia in 1824. It is important to note that only the female tick causes paralysis; the mechanism by which it injects its paralysing venom into the host is not properly understood.

In adult animals a high degree of immunity develops: serum from these animals has been used therapeutically in animals in Australia with good effect, but not, so far, in human beings. The symptoms, course and treatment of the disease in man are discussed.—S. M. G.

GREGSON, J. D. (1943.) **The influence of fertility on the feeding rate of the female of the wood tick, *Dermacentor andersoni* Stiles.**—*Rep. ent. Soc. Ont., 1943.* pp. 46–47. **356**

G. presents evidence which indicates that copulation hastens the rate of feeding of *Dermacentor andersoni*. Further work designed to corroborate this finding failed.—G. B. S. HEATH.

See also absts. **304** (*Glossina*), **307** (*Triatoma*), **315** (mosquitoes), **487** (*Melophagus*), **265** (tick transmission of staphylococci), **433–447** (insecticides).

PARASITES IN RELATION TO DISEASE [HELMINTHS]

DÉVÉ, F. (1942.) Les embryons hexacantes échinococciques sont-ils susceptibles de cheminer dans les voies lymphatiques? **[Can the hexacanth embryos of *Echinococcus* traverse the lymph vessels?]**—*C. R. Soc. Biol. Paris.* **136.** 647–648. **357**

D. considers that the arguments put forward in favour of the lymphatic migration of the hexacanth embryos of *Echinococcus* are obsolete. From a methodical microscopic study of tissues from six unweaned pigs experimentally infected in 1908–10, he has verified that there was no lesion of a parasitic nature in the mesenteric lymph nodes although the viscera were much parasitized. He concludes that passive migration of the embryos *via* the lymph channels and thoracic duct probably plays no part in the usual pathogenesis of echinococcosis any more than does their active migration. The course followed appears to be exclusively a blood route.—J. N. O.

GIBSON, T. E. (1945.) **Tapeworm in freshwater fish. [Correspondence.]**—*Brit. med. J.* Feb. 10th. 199–200. [See also *V. B.* **15.** 49, absts. 312–314.] **358**

G. records a very mild outbreak of disease, caused by infestation with plerocercoids of a species of *Diphyllobothrium*, in trout in a Northamptonshire reservoir during the latter part of 1944. Plerocercoids recovered from the peritoneal cavity of one trout were fed to a g. pig and three rats; no evidence of infection was noticed in the g. pig, but all the rats passed *Diphyllobothrium* eggs in their faeces for varying periods and finally threw off the infestation. 40% of just over 100 smaller fish taken from the reservoir, including species other than trout, harboured one or more smaller plerocercoids; these were fed to rats but so far have not yielded positive results. Fifty dead grebe from the same source were not examined for tapeworms.—J. N. OLDHAM.

LEHMENSICK, R. (1942.) Ueber die Trichinose in der freien Wildbahn. (Weiterer Beitrag zur Epidemiologie der Trichinose). **[Trichinosis in wild game animals.]**—*Zbl. Bakt. I. (Orig.).* **149.** 338–344. **359**

L. discusses the relationship of trichinosis in pigs and vermin, and considers the influence of sanitation and meat control on the incidence of this disease in vermin. In German-occupied Poland the incidence of trichinosis in foxes examined was 21 ± 4·5% compared with a similar figure of 4 ± 2·5% in the Rhineland.

—R. A. ROPER.

ANON. (Undated.) **Special war-time control of worm parasites.**—*Handbook for Woolgrowers, Australia.* Reprint pp. 12. **360**

This supplement to the *Handbook* (prepared

for the Australian Wool Board by a number of officers of Commonwealth and State animal health organizations) contains information for the sheep owner about the selection, preparation, dose rates and cost of anthelmintics and describes general methods for control of worm parasites of sheep. A photograph of the alimentary tract of the sheep gives the location of the various species of worms and a diagram demonstrates the life-cycle, epidemiology and control of the nodular worm (*Oesophagostomum columbianum*). The technique for administration of enemas of sodium arsenite against this parasite is described.

Wartime shortages of carbon tetrachloride, nicotine sulphate and phenothiazine are considered with regard to the most economical and effective use of these drugs and of substitutes for them.—H. McL. Gordon.

See also absts. **448**, **449** (phenothiazine).

Gordon, H. McL. (1942.) **Economy and efficiency in the control of worm parasites of sheep.** pp. 27. Melbourne, Australia: Council for Scientific and Industrial Research, Division of Animal Health & Nutrition. 4to. Mimeographed. **361**

This contains somewhat more detailed, but substantially the same, information as that given in the *Handbook for Woolgrowers* [see preceding abst.]. There are no illustrations.

SPONTANEOUS AND TRANSMISSIBLE NEOPLASMS AND LEUCAEMIAS [INCLUDING FOWL PARALYSIS]

Drieux, H., & Priouzeau. (1945.) Les tumeurs du thymus chez les bovidés. **[Tumour in the thymus gland in bovines.]**—*Bull. Acad. vét. Fr.* **18.** 137–153. **362**

A survey is made of the literature dealing with bovine thymic tumours from 1879 until 1941. The problem of differential diagnosis is discussed, followed by a few remarks concerning histophysiology.

A case is described in which the tumours occurred at the base of the neck and in the parotid region of a heifer aged eight months. Diagnosis was established by a biopsy and the animal was kept under observation for a further two months, during which time it retained its appetite, but lost weight. It was then slaughtered.

It was found P.M. that the original growth at the entrance to the chest had diminished in size, but that the tumour in the parotid region was larger than when first observed. It was noted that the blood was very slow in clotting. The pituitary, pancreas, adrenals, ovary and spleen were submitted to histological examination. The adrenals and the ovaries were abnormal, the adrenals being in a retarded state of development and the ovaries atretic and without primordial follicles. The spleen red pulp contained very few blood elements and there was evidence of considerable destruction of red blood corpuscles. The pituitary had an abundance of eosinophilic cells in the pars anterior, as in a castrated animal.

The authors consider that these observations support the evidence of correlationship between the thymus and the endocrines. They suggest that the delayed clotting of the blood may indicate that the thymus plays a part in blood coagulation.
—John G. Campbell.

Ojemann, J. G. (1941.) Een geval van metastasevormend paragangloom bij het paard. **[Metastatic paraganglioma in a horse.]**—*Tijdschr. Diergeneesk.* **68.** 198–203 & 204. [English, French and German summaries.] **363**

Paragangliomas are rare neoplasms of the adrenal medulla, springing from chromaffin cells. They are histologically benign and seldom metastatic, but give rise to excessive secretion of adrenalin, which in man leads to progressive hypertension. The case described by O. of paraganglioma in a horse was noteworthy for its cardiovascular syndrome and metastasis and for the co-existence of another type of neoplasm in the ovary.

The horse developed oedema of the head and both hind limbs and could not stand. Clinical examination revealed a rapid irregular pulse and a hypertrophied heart. Destruction was advised and P.M. there were hydraemic emaciation, serous fluid in the chest and abdomen, oedema of the lungs and enlargement of the heart with thinning of the walls. There was a haematoma-like tumour the size of a football in the wall of the colon, both adrenal glands were very large and there were small red tumours in the lumbar lymph nodes. The right ovary was the size of a coconut and resembled a sarcoma. The left ovary was not enlarged but contained a small red tumour like those in the other organs. The liver was in a condition of chronic venous congestion.

The histology of the tumours is described, these being identified as paragangliomas.—J. E.

Greene, H. S. N. (1946.) **The microscope or the guinea-pig?**—*Yale J. Biol. Med.* **18.** 239–242. **364**

Transplantation of malignant growths into the anterior chamber of the eye in g. pigs is a simple and useful method for studying the nature of tumours of doubtful structure. G. describes one example in which this method enabled the

histological classification of a growth to be decided when previous microscopic study had given an unsatisfactory answer. A tumour of the dorsal spine, involving the spinal arachnoid space, was diagnosed histologically as a haemangioblastoma. At a later biopsy a small fragment of the growth was implanted in a g. pig and subsequently developed to form a typical chondrosarcoma. The patient died with metastases and both the primary and secondary tumours proved to be chondrosarcomas.

The method of transplantation consists in opening the anterior chamber of the eye of the g. pig after application of 5% procaine and introducing a piece of tumour measuring about 0·5 mm. into the inferior angle of the iris. The corneal incision is not closed. Selected fragments must not contain necrotic tissue nor must they consist mainly of connective tissue stroma. They can be selected from material kept in the refrigerator until frozen sections of the tumour have shown the best areas to select. The mere fact of growth occurring in a heterologous transplant identifies the tissue as malignant; benign tumours, granulomas and normal tissue do not grow. Increased differentiation in the transplanted tissue frequently allows the true nature of a tumour to be determined.—E. G. White.

Howes, E. L. (1946.) **Carcinogens and the regeneration patterns after injury.**—*Cancer Res.* **6.** 298–310. [Author's summary slightly amended.] **365**

Collagen fibres are destroyed in the dermis as the result of repeated applications of a carcinogen, whereas epithelial cells survive and remain hyperplastic. The fibres regenerated in the dermis under the influence of the carcinogen are sparse and do not differentiate. Many mononuclear cells are present between them.

The rate of epithelial proliferation in the presence of the carcinogen is not increased above the rate occasioned by another form of injury. Muscle is destroyed about the buried carcinogen, together with the phagocytic cells that might remove it from the site. Fibroplasia is notably altered by the buried carcinogen. Reticulin fibrils are not produced between the fibroblasts; or if they are produced they are destroyed again, as in the dermis. The fibrils do not differentiate. On the other hand, fibroblasts survive the destruction, particularly at a distance from the focus. In both anatomical locations the carcinogen leaves the cells—fibroblasts and epithelial cells—free to proliferate because of the lack of properly organised intercellular substance, and hyperplastic because of injury.

It is suggested that the late appearance of the tumour is due to the time required for the damaged collagen fibres to be absorbed and for the reformation of new connective tissue barriers to fail. No justification can be found for the theory that the carcinogen stimulates the cells directly to the formation of a tumour.

The usual guinea pig is resistant to carcinogens because leucocytes and giant cells are not destroyed by the chemical; hence the chemical is phagocytized. The implantation of a thread impregnated with a carcinogen is recommended as a means of studying the production of tumours. It might be useful, also, in determining whether a chemical is a carcinogen.

A plea is made for a more intense study of the significance of connective tissue in neoplasia.

Engelbreth-Holm, J. (1944.) **A transplantable cornifying squamous-cell carcinoma in mice.**—*Acta path. microbiol. scand.* **21.** 418–422. [In English.] **366**

Study of this tumour provides a contribution to the knowledge of the histology of transplantable tumours. It arose in the subcutaneous tissue of the cheek of a mouse of the Aka leucaemic strain, probably from the buccal epithelium. Histologically, it was found to be a typical squamous cell carcinoma, with marked keratinization. Transplants grew to enormous tumours, killing the recipient mice in 4–5 weeks. Sixty-two passages gave 100% successful takes in 600 mice of the Aka strain: untreated mice of other strains were not susceptible. As is usual with transplantable tumours, passage resulted in greater virulence; in this instance there was morphologic change to a less differentiated type of cellular structure and loss of the keratinization which had been a predominant feature of the primary tumour.—J. B. B.

DISEASES, GENERAL

Ritchie, J. N. (1946.) **Notes following a visit to U.S.A. and Canada, October, 1943–April, 1944.**—*Vet. Rec.* **58.** 33–38 & 45–50. **367**

R. describes the control of animal diseases especially TB. and brucellosis, in the U.S.A. and Canada. The vast area to be considered and the tendency towards specialization in agriculture necessitate control methods different from those in Great Britain.

Every state in the U.S.A. is now Modified Accredited TB.-free, *i.e.*, has less than 0·5% of reactors. In New York State the number of reacting cattle slaughtered in one county since eradication was commenced equalled the total

cattle population of the county; in the whole State approximately 1,000,000 had been slaughtered as reactors between May, 1918 and October, 1937. The incidence of infection never rose beyond 6% for the country as a whole.

The subcutaneous and later the single intradermal test in the caudal fold were used, frequently accompanied by a test in the vulva. Reactors were slaughtered. Slaughter was facilitated during the years of financial depression by the low level to which cattle prices fell.

Skin TB. and the "no-lesion" reactors have been sources of trouble. "Area-freedom" has been aimed at rather than "herd-freedom" and is vastly preferable.

For the control of contagious abortion, the "test and slaughter" policy was originally adopted; this method is now largely replaced by vaccination, especially with strain 19, although on some farms both methods have been practised.

There is no official scheme for the control of mastitis, which appears to be a serious problem; opinion generally calls for more stress on hygiene and better milking processes.

Trichomoniasis is probably more widespread than is realized and swine fever is an urgent and serious problem. The serum-virus method for control of swine fever is practised, but much harm is done by unskilled workers since anyone can procure the necessary materials. In the Middle West, swine fever is diagnosed from the clinical picture and P.M. findings. A useful chart is appended for the differential diagnosis between swine fever and swine erysipelas.

A description is included of the research work that is being carried out in the various institutes. Federal meat inspection is confined to those packing houses from which meat or meat products will be exported. In normal times 70–75% of meat is under inspection. The report ends with a short description of the organization of the Canadian Health of Animals Branch, a discussion of the problem of TB. and brucellosis in Canada, and a note on meat inspection in that Dominion.—D. S. Rabagliati.

Kerr, W. R., McGirr, J. L., & Lamont, H. G. (1946.) **"Blue nose disease" in the horse.**—*Vet. Rec.* **58.** 28. **368**

A disease is described affecting horses at grass in the Garvagh, Colraine and Bushmills area of Northern Ireland. The main symptoms observed were oedema of the nostrils, with a faint purplish tinge on the hairless pigmented muzzle just below the nostrils, and signs of cerebral disturbance varying from depression in some cases to extreme excitement in others. In animals which recovered oedema was followed by sloughing of the skin. The mortality rate was thought to be in the region of 70%, death occurring after a few hours or in 3–4 days; animals which survived four days usually recovered. A full stomach and an empty small intestine were the features most commonly seen at examination P.M., but no brain studies were made. The authors discuss reasons for considering that this disease may be of anaphylactic origin.—H. W. S.

*Andres, I. (1943.) Zeitgemässe Massnahmen zur Bekämpfung der chronischen Seuchen beim Rind. **[Control of chronic cattle diseases.]**—*Schweiz. landw. Mh.* **1.** 1–12. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 299–300.] **369**

TB., brucellosis and mastitis have been known for 100 years in Switzerland. Abortion due to trichomoniasis has been encountered only in the last 20 years. TB. is diagnosed clinically, or in the early stages by the tuberculin test. Brucellosis has to be differentiated from abortion due to *Trichomonas* infection. Repeated examination of blood, uterine excretions, the dead foetus and foetal membranes is necessary for the diagnosis of brucellosis. Trichomoniasis cannot be diagnosed by examination of blood or by infection of experimental animals, but by examination of the aborted foetus, foetal membranes, vaginal mucus, seminal fluid, or vaginal washings.

Education of farmers and distribution of information have been found valuable. State assistance has been offered to farmers for payment of veterinary inspection. Decrees were passed in 1942 for the prevention and localization of the above-mentioned epidemics.—E. Kodicek.

Roberts, R. S., & Bolton, J. F. (1945.) **A venereal disease of sheep.**—*Vet. Rec.* **57.** 686–687. **370**

A venereal disease of sheep is described which occurred in November, 1944, in a flock of 370 Welsh ewes and 12 rams on permanent pasture. There had been no breeding trouble in the previous season and no replacements had been made, except for a number of lambs introduced a year previously. The first symptoms were noted 16 days after the rams were turned out with the ewes. Ten rams were affected in all, the most characteristic lesion being a deep-seated ulceration of the glans penis with preputial discharge and, in some cases, paraphimosis. A number of ewes had acute vaginitis with vaginal discharge. The disease did not appear to have much effect upon fertility as a normal crop of lambs resulted.—H. W. S.

Pinkerton, H. E. (1946.) **Diseases of swine.**—*Iowa Vet.* **17.** No. 2. 7–11, 36 & 38. **371**

A general survey is made of swine diseases, including porcine brucellosis, swine erysipelas, swine fever, and nutritional disorders.

Swine erysipelas serum has proved extremely effective in acute cases of the disease, but serum and culture vaccination should not be practised except on premises where the disease is known to be present, because of the danger of establishing infection on clean premises; there is also danger that the veterinarian may infect himself.

Since 1916, when the general use of swine fever antiserum and virus became established, there has been a marked increase in the incidence of the disease during only one year, 1926. Nevertheless, there is no indication that eradication is being achieved: the disease causes a steady loss annually of 2–3% of all pigs farrowed.—D. D. O.

HALLQVIST, C. (1943.) Svinbesättningarnas hälsotillständ och dess betydelse för gödningens ekonomi. [**Health of pig herds and its importance for the economy of fattening.**]—*Sv. Sinavelsföreningens Tidskr.* No. 11. pp. 257–265. **372**

Pig influenza (*svinsjuka*) is widespread in Sweden, and seriously affects breeding results. Some of the consequences of the disease are high piglet mortality, poor litter weights in sows and unsatisfactory thriving of bacon pigs.

Measures of control of the disease are discussed. These include *inter alia*, improvement of ventilation, ruthless culling of animals with disease symptoms and of sows with poor litter weights, and reduction of the number of animals per sty. —R. PETER JONES.

PAULI, C. (1943.) Ein Beitrag zur Kenntnis der trabekulären Hypertrophie der Harnblase beim Hunde. [**Trabecular hypertrophy of the bladder in dogs.**]—*Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* Oct. 29th. 374–375. **373**

A case of enlarged bladder with retention of urine in a bitch is described. After death, eight litres of urine flowed without interruption from the bladder. P.M. there was no ascites, but trabecular hypertrophy of the bladder due to a partial tonic sphincter cramp. On dissection, 1 litre more of urine was obtained from the bladder. Beyond a slight dilatation of the heart, the organs were normal. Injected blood vessels on the surface of the bladder were clearly visible and in many places the bladder wall was nearly 1 cm. thick. Histological sectioning revealed great distension of both the connective tissue and the musculature, with intertwining and hypertrophy of muscle bundles. Differentiation between ascites, as diagnosed by palpation and percussion, and trabecular hypertrophy is discussed.—K. J. SINCLAIR.

HOLROYD, H., & HOGG, A. H. (1946.) **Clinical report on a glandular disease occurring in epidemic form amongst dogs.**—*Vet. Rec.* **58.** 182–184. **374**

The authors describe a disease considered to be epizootic in character, which they observed in ten dogs in 1944 and in 40–50 in 1945. Most of the animals came from Blackburn and dogs of various breeds and ages were affected. The symptoms consisted in pyrexia (105°–106°F.) and enlargement of the submaxillary lymph nodes and then of the cervical and sometimes the axillary nodes, followed by their rupture and discharge of a thick, haemorrhagic exudate. Subacute and chronic cases occurred, in which resolution was slow and systemic symptoms were slight. Autopsy showed enlargement of various internal lymph nodes. Five of the animals died: the others responded well to local treatment of the neck glands and administration of sulphathiazole. In no case was a bacteriological examination carried out. There was no evidence that the disease was associated with distemper and the authors suggest that it was due to staphylococci or streptococci. Chronic cases might easily be confused with leucosis.—E. G. WHITE.

SVIRIDENKO, P. A. (1944.) **Distribution and mode of feeding of field mouse *Apodemus agrarius* Pall. and its bearing on epidemics.**—*C. R. Acad. Sci. U.R.S.S.* **42.** 96–100. [In English.] [Abst. in *Bull. Hyg., Lond.* **20.** 182, copied *verbatim*. Signed: J. F. CORSON.] **375**

The field-mouse, *Apodemus agrarius* Pall., is found in the middle belt of western Europe, in the wood-steppe zones of the European part of the Soviet Union, in parts of the Caucasus, southern and middle Urals, North Kazakhstan, Semirechie, the southern districts of Siberia (except Transbaikalia), China, Korea, Manchukuo, and the southern districts of the Far-East region. It is not found in the south-eastern steppe regions of the Ukraine, in the Don, Near-Azov, Kalmuck and Cis-Caucasian steppes. Farther south it is common in the northern foothills and mountains of the Caucasus and the Black Sea littoral, from Novorossysk to Gagry.

It is suited to the sub-tropical climate of the Black Sea littoral but, being relatively resistant to cold, is found up to a height of 1,600 metres and almost as far north as Lat. 65° (Karelia).

It thrives best in a moist climate and its numbers diminish greatly during drought; in places where the annual rainfall is less than 350 mm. it is found only along the banks of rivers and lakes, in vegetation with a humid micro-climate.

It makes its home in various surroundings—forest, gardens, thickets, ricks, storehouses, and even human dwellings. It eats various kinds of food—seeds, roots, leaves, and insects. It makes shallow burrows and does not store food.

It is resistant to many of the diseases of

rodents, *e.g.*, tularaemia, and is quite resistant to spring-summer encephalitis; it is, however, infested with the ticks, *Ixodes persulcatus* and *I. ricinus*, which transmit encephalitis, and, as it lives in the same places as the water-rat, which conveys tularaemia in the Soviet Union, and, from its habits and motility, is likely to make contact with many rodents, it is probably of considerable epidemiological importance.

LIEGEOIS, F., & GENGOUX, P. (1940.) Pancréatite chronique du chien. **[Chronic pancreatitis in a dog.]**—*Ann. Méd. vét.* **85.** 7–13. **376**

A six-year-old German sheepdog lost weight despite polyphagia and passed copious stools. The faeces were yellow in colour and had a finely granular appearance; they were of the consistency of ointment, but not fatty. No evidence was found of such diseases as TB., nephritis, diabetes mellitus, or intestinal parasitism and a Schmidt test showed that protein was being digested normally. It was noted that the bulk of the faeces increased when the food contained more bread and that it then contained an enormous number of starch granules. It was suggested that as the pancreatic juice plays a major part in the digestion of carbohydrate in dogs, there might be in this case a lesion of the exocrine portion of the pancreas; when the animal was destroyed, there was, in fact, a chronic pancreatitis.—E. COTCHIN.

LANDÉ, K. E. (1944.) **Diabetes mellitus in a cat.**—*Amer. J. clin. Path.* **14.** 590–591. **377**

This is a detailed account of the history, symptoms and P.M. examination of a four-year-old female cat with diabetes mellitus.—H. W. S.

MEMBER, S., BRUGER, M., & OPPENHEIM, E. (1944.) **Experimental atherosclerosis. VI. Effects of various bile acids on cholesterol levels.**—*Arch. Path.* **38.** 210–214. [For part V, see *V. B.* **14.** 343.] **378**

When cholesterol, together with cholic acid or glycocholic acid, was fed to rabbits, the cholesterol level in the blood was higher than in control rabbits receiving cholesterol alone. Dehydrocholic acid, hyodesoxycholic and desoxycholic acid did not have this effect. Cholic acid and glycocholic acid probably increase the absorption of cholesterol from the intestine and by raising the level of cholesterol in the blood cause increased deposition in the liver and aorta.—E. G. WHITE.

BLAKELY, C. L., & MUNSON, T. O. (1945.) **Rupture of the diaphragm.**—*J. Amer. vet. med. Ass.* **107.** 292–299. **379**

The causes, symptoms and diagnosis of rupture of the diaphragm in the dog and cat are described. Treatment is by surgical operation. Patients are fasted for 12–18 hours and given 0·01 grain of atropine. To provide artificial respiration a rubber colon tube connected to pump is passed into the trachea and tied to the jaw. At the pump end of the tube is cut an elliptical opening about ½ in. long, which the anaesthetist blocks with his thumb while inflating the lung. He then removes his thumb and the expired air can be heard escaping.

Deep anaesthesia is induced with pentobarbital sodium, and a midline incision made. The falciform and round ligaments of the liver are removed and then the visceral organs are drawn back from the thorax. Any fluid in the chest is aspirated. The diaphragmatic wound is sutured and the abdominal wall is closed. The air is then exhausted from the pleural cavity with a Scannell transfusion syringe with a three-way tip and artificial respiration is stopped, so that normal respirations can recommence. About 50% of the authors' earlier operations were successful, but their last six animals all recovered.
—J. O. L. KING.

HERBUT, P. A., & KINSEY, F. R. (1946.) **Transitory pulmonary infiltrations (Loeffler's syndrome) in rabbits.**—*Arch. Path.* **41.** 489–525. [Authors' summary copied *verbatim*.] **380**

Thirty rabbits received a single intravenous injection of 200 mg. of alloxan per kilogram of body weight in a 4 per cent solution. Of 25 animals that died within thirty days, 14 per cent disclosed necrosis of the epithelium of the proximal convoluted tubules of the kidneys similar to that seen in mercury bichloride poisoning. In at least 8 of these, the necrosis was severe enough to account for the uremia in which the animals died.

Ten of 11 animals that died within the first four days after the injection of alloxan disclosed extensive necrosis of the peripheral portions of the hepatic lobules. Such changes have not been previously reported observed in alloxan diabetes.

In the pancreas the disappearance of the necrotic islets of Langerhans may be accounted for by the traceable proliferation of adjacent exocrine cells rather than by mere absorption of the detritus and collapse of the "unsupported" walls.

HYSLOP, G. H. (1945.) **Distant secondary circulatory and vasomotor reactions to accidental electric shock.**—*Bull. N. Y. Acad. Med.* **21.** 302–306. **381**

When an electric current traverses the body its path is the shortest distance between entry and exit. The effect on the tissues depends on the amperage and the duration of the current. Primary effects occur in the tissues through which the

current passes and secondary effects may occur in other tissues, such as the brain, through which the current has not passed. H. suggests that stimulation of sympathetic ganglia and plexuses (splanchnic, coeliac, cervical) may be sufficiently violent to cause vascular disturbances in distant organs such as the brain, with resulting temporary or permanent effects on the nervous tissue. This may explain the delayed clinical symptoms of brain damage often seen up to 2–3 days after the electrical injury. The article is essentially a review of some recent papers.—E. G. WHITE.

DURAN-REYNALS, F. (1946.) **A necrotizing disease in rabbits affecting fatty and muscular tissues. Analogies with the Weber-Christian disease of humans.**—*Yale J. Biol. Med.* **18.** 583–594. [Author's summary copied *verbatim.*] **382**

A disease is described which was observed some years ago mostly in rabbits of the Rockefeller Institute at New York.

The process can be divided into two phases. In the quiescent phase, one observes either petechial or larger hemorrhages, mostly in fat and muscles, together with necrosis and also fibrotic nodules in muscles. The clinical phase, in the majority of cases, is manifested only after the inoculation of the rabbits with a variety of unrelated materials such as viruses, bacteria, tissue extracts, and even Ringer's solution. Shortly after the inoculation of these materials, one can feel by palpation the presence of large, firm masses in the abdominal fat.

The abdominal masses are the result of a primary necrosis of the fat followed by a moderate inflammation and conspicuous fibrosis. The lesions of the quiescent phase are constantly present in rabbits showing the clinical phase of the disease. On the other hand, rabbits with the quiescent phase may never show the clinical phase.

Complete disappearance of the abdominal masses may take many months, and there are indications that the process shows frequent relapses.

The epidemic-like form of the disease, the absence of infectious agents demonstrable by direct examination or cultures, and the character of the lesions lead one to suspect a viral etiology. However, attempts to prove or disprove this hypothesis failed, chiefly because of the wide occurrence of the disease under natural conditions.

The analogies between the disease in rabbits and the Weber-Christian disease, and still other diseases of man, are discussed.

RANDALL, A. (1944.) **Recent advances in knowledge relating to the formation, recognition and treatment of kidney calculi.**—*Bull. N.Y. Acad. Med.* **20.** 473–484. **383**

R. reviews briefly the various factors concerned in the production of primary renal stones. The most important factor is the excretion of urine overloaded with salts in a condition of supersaturation, verging on precipitation. This alone, however, is not sufficient to cause calculus formation: only about 3% of persons with cystinuria, for instance, develop cystine stones; an initiating lesion in the renal pelvis is necessary to cause calculus formation. Other factors believed to be important in favouring calculus formation are vitamin A deficiency, hyperparathyroidism, infection, colloid imbalance and urinary stasis. In a large number of cases R. observed a high proportion of papillary calcification but no inflammatory reaction. Local renal infection is probably only a rare cause of renal calculi. The prevention of calculus formation and recurrence should include :– chemical analysis of calculi, adjustment of the reaction of the urine, clearing up of focal infections, intake of large amounts of water, and provision of a well balanced diet.—E. G. WHITE.

COLLERY, L. (1944.) **Non-septic spermiophagia in the male guinea pig** (*Cavia cobaya*).—*Proc. R. Irish Acad.* Sect. B. **50.** 23–38. **384**

There appears to be little relationship between the occurrence of a seminal leucocytosis in g. pigs and dietary or environmental conditions. The effect of electrical stimulation of semen production and its frequency on the presence of leucocytes in the semen is considered. A description is given of a condition of spermiophagia (phagocytosis of spermatozoa) within the genital tract of the male, and its occurrence and probable influence on male fertility are discussed. Some information is given concerning the nature and source of the particular phagocyte cells involved, and suggestions are made as to the probable significance of their occurrence.—A. EDEN.

HARRISON, R. G. (1946.) **Relation of the adrenal cortex to arthritis.**—*Lancet.* **250.** 815–818. [Author's summary copied *verbatim.*] **385**

Experiments designed to study the relation of repeated injections of desoxycortone to rheumatic lesions in the rat are described.

It has not been possible to show that desoxycortone is a factor in the causation of arthritis in rats.

Infection, either directly or indirectly, is intimately concerned with the production of rheumatic cardiac lesions and nephrosclerosis.

Low air temperatures may also play a part in the aetiology of nephrosclerosis and rheumatic cardiac lesions, and should be considered in future experiments.

DRAPER, G. (1945.) **On certain biological factors**

in human disease.—*Bull. N.Y. Acad. Med.* **21.** 599–609. **386**

The interplay of various factors in producing disease is illustrated by an account of three patients. The three cases illustrate the interaction of emotional, genetic and hormonal factors in the causation of disease.—E. G. WHITE.

*NORCINI-PALA, L. (1942.) Su di un caso di encefalite tossica acuta secondaria a tiflodiverticalite emorragica nel cane. [**Acute toxic secondary encephalitis due to diverticulitis of the caecum in a dog.**]—*Clin. vet., Milano.* **65.** 239-251. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 105.] **387**

The case is described of a dog with chronic constipation and diverticulum formation in the caecum with toxic symptoms; the symptoms were thought to result from an attack of distemper six months previously. P.M., there were meningitis and encephalitis, characterized by capillary lymphoid infiltration in the grey matter, ectasia of the lateral ventricles and oedema of the choroid plexus.—J. ZWEIG.

BRITTON, J. W. (1945.) **An equine hermaphrodite.**—*Cornell Vet.* **35.** 373–375. **388**

This is a case report of the treatment of a hermaphrodite. The subject was a two-year-old thoroughbred born to a mare which had previously produced several normal foals to the sire of this animal. The general appearance was that of a mare with a well developed udder and relatively large vulva, from which protruded an enlarged clitoris enclosed within a sheath. The clitoris was capable of erection which was said to be associated with ejaculation and the passage of urine. Rectal examination revealed a uterus of normal size and consistency suspended between a left gonad in the sub-lumbar region and a right gonad at the inguinal ring. The animal exhibited irregular heat periods and acted like a stallion to other mares on heat.

On operation a testicle, which was removed, was found attached to the uterine horn on the right side. As on the left side no gonad could be located, the operation was concluded. Section of the testicle revealed a typically immature gland with no evidence of spermatogenesis. A month later the animal was acting like a normal mare and it was thought the clitoris was undergoing atrophy.—C. W. OTTAWAY.

See also absts. **286** (abscesses in goats), **288** (syncope in pigs), **289** (arthritis in pigs), **293** (diseases of foals), **327** (hepato-encephalitis of horses), **332**, **451** (calf scours), **333** (bovine bronchitis), **355** (tick paralysis), **395** (hydronephrosis), **452** (dermatitis), **456** (lameness in horses).

NUTRITIONAL AND METABOLIC DISORDERS

FRENCH, M. H. (1945.) **Geophagia in animals.**—*E. Afr. med. J.* **22.** 103–110 & 152–161. **389**

F. reviews the theories advanced to explain geophagy, especially as it occurs in Africa. He suggests that the habit may be due (a) to the satisfaction of a passing fancy for something of condimental value, (b) to a craving for something missing from the diet or (c) to an expression of ill health or serious malnutrition; it may also result from copying other animals.

The theory of BUNGE (1873) that excessive intake of potassium impoverished the body of sodium and chlorine and resulted in a craving for earths and salts containing sodium and chlorine is no longer accepted. The habit may result from an attempt to correct either a shortage of calcium or a shortage of some trace element in the diet, but adequate explanation is lacking and further work is necessary.—M. C.

*JAHN, H. (1942.) Gesundheitsstörungen beim Rind durch neuzeitliche Fütterung. [**Disease related to new methods of feeding cattle.**]—*Inaug. Diss., Berlin.* pp. 77. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 187.] **390**

This is a general discussion on the development of feeding methods under wartime conditions for young animals, dairy cattle and working animals. Subjects discussed include fattening, feeding stuffs of animal origin, disturbances caused by over-feeding with proteins, disturbances in mineral metabolism, the influence of nutrition on resistance to infection and fertility, avitaminosis and hypovitaminosis.—J. ZWEIG.

CANNON, P. R. (1944.) **Protein metabolism and acquired immunity.**—*J. Amer. diet. Ass.* **20.** No. 2. 77–80. **391**

The antibodies which are the basis of acquired immunity are modified globulins. Any deficiency in protein intake results in an impaired synthesis of all protein, including antibodies. The clinical, chemical, and experimental data supporting this statement are discussed. The frequency of severe terminal infections in patients dying of chronic diseases with wasting indicate that the hypoproteinaemia found is an index of insufficient antibody production.—J. B. BROOKSBY.

THEISS, O. (1944.) Ein Beitrag zur Osteomyelosklerose des Geflügels. [**Osteomyelosclerosis in domestic fowls.**]—*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **52/50.** 266–269. **392**

Histopathological examination of the carcasses of 400 birds, including hens, ducks, geese and turkeys, revealed osteomyelosclerosis in 62%; about 86% of birds which had inflammation of the

oviduct and peritoneal cavity were affected. Ingestion of excessive amounts of calcium phosphate did not *per se* cause the disease. The changes noted in the blood picture and in the liver and spleen were not sufficiently uniform to be of diagnostic value. The fact that birds with inflammation of the oviduct and peritoneum usually have a laying capacity above the average and a high incidence of osteomyelosclerosis suggests that a high rate of egg production may possibly be one of the factors contributing to the onset of the disease.—E. M. CRUICKSHANK.

COMAR, C. L., DAVIS, G. K., & TAYLOR, R. F. (1946.) **Cobalt metabolism studies: radio-active cobalt procedures with rats and cattle.** —*Arch. Biochem.* **9.** 149–158. **393**

Observations are reported on the fate of radio-active cobalt administered orally and intravenously to rats and cattle.

After oral administration to rats of doses of 2–3μg. of labelled Co, about 10% of the dose was rapidly eliminated in the urine; faecal excretion occurred mainly during the first 48 hours and within five days in most cases about 80% had been excreted. Usually all the Co was eliminated in the urine and faeces in less than six days. The excretion was apparently not affected by differences in the diet such as whether stock or low-mineral diets were fed. Analysis for radio-active Co made on tissues showed that with the exception of those organs containing Co destined for excretion only the liver showed consistent accumulation.

For study of Co distribution in bovine tissues, animals were used which were in poor condition due to being maintained on a low-Co diet containing less than 0·01 p.p.m. Co. After oral administration of 1,330 μg. labelled Co to a steer on such a diet very little was found in the tissues 10 days later; the greatest amount occurred in the liver which contained 0·25% of the administered dose. After injection of 2,400 μg. into the jugular vein of a heifer there was general distribution throughout the tissues, yet after 10 days less than 5% of the administered dose was retained by the animal, 1% being found in the liver. After intravenous injection of 260 μg. and 1,330 μg. Co respectively into two other animals significant amounts were found in the abomasum contents while none was found in the contents of the reticulum, omasum, or rumen. It is stated that these results are not in disagreement with the report that injection of Co is apparently not as effective as oral administration in alleviating deficiency symptoms in ruminants.—R. ALLCROFT.

SKINNER, J. T., & MCHARGUE, J. S. (1945.) **Response of rats to boron supplements when fed rations low in potassium.**—*Amer. J. Physiol.* **143.** 385–390. **394**

In investigations to ascertain whether boron is essential in the metabolism of animals, rats with limited stores of boron (obtained by feeding on a diet of whole milk until they weighed 40–50 g.) were maintained on a basal ration which was adequate, except that boron and potassium were present in amounts of only 0·45 p.p.m. and 51·0 p.p.m. respectively. Boron supplements were made by mixing weighed amounts of either boric acid or borax with portions of the basal ration and a potassium supplement was made by incorporating dipotassium phosphate in the same way. Very little growth was possible on rations containing such low concentrations of potassium, but there was no appreciable loss of weight in the animals. The results indicated that boron supplementation of rations low in potassium failed to promote growth but prolonged the survival time of the rats. The livers of rats given boron supplements for 21 days contained, moreover, 47% more glycogen than those receiving no boron.

Boron analyses showed that the concentration of this element ranged from 0·91–1·59 p.p.m. in animals with a low intake of boron. The concentration in those receiving 100, 250 and 500 p.p.m. for 21 days was 6·94, 8·95 and 21·04 p.p.m. respectively. A concentration of 38·2 p.p.m. was found in rats given small supplements of potassium in addition to 1,000 p.p.m. boron.—R. ALLCROFT.

LOWENHAUPT, E., & GREENBERG, D. M. (1946.) **Renal changes associated with a chloride-deficient diet in the rat.**—*Arch. Path.* **42.** 49–55. [Authors' summary copied *verbatim.*] **395**

A renal lesion uniformly develops in rats maintained on a chloride-deficient diet. Early in the process calcium is precipitated in the lumens of collecting tubules, with consequent blocking and hydronephrosis. A granulomatous inflammatory response is a characteristic early reaction to the foreign material and to the degenerating tubular epithelium. Chronic alkalosis is suggested as the basis of the precipitation of calcium.

NILSSON, N. E. (1944.) Svinens rakitis, dess symtom och orsaker. **[Rickets in pigs, its symptoms and causes.]** — *K. LandtbrAkad. Handl., Stockh.* **83.** 406–419. [English summary.] **396**

The symptoms of rickets in young pigs are described. Apart from the characteristic bending of the long bones, the symptoms are irritability followed by stiffness, muscular cramp and eventually paralysis. Osteoporosis, tetany and osteomalacia are separate diseases which may occur concurrently with genuine rickets.

Rickets is caused not so much by a deficient intake of Ca and P, but by defective absorption. Both elements must be capable of solution by

chemical action in the digestive tract ; only when they are in soluble and ionized form can they be adequately absorbed. An acid reaction in the small intestine and the presence of phytase favour this : if they are absent the phytic acid existing in some cereals binds the Ca and P in insoluble form, so that they pass unabsorbed through the gut. Rickets follows inadequate Ca and P in the blood, as a result of poor absorption. The importance of vitamin D is generally accepted, though its mode of action is not properly understood : it may merely influence absorption when the acid-base ratio is unsatisfactory, but in certain circumstances, as when given in the diet or produced by sunlight, can prevent rickets in pigs otherwise prone to develop it. Open-air exercise prevents rickets, but in what way is unknown.

This paper is a review of the literature rather than an original contribution.—J. E.

PETERING, H. G., MARVEL, J. P., GLAUSIER, C. E., Jr., & WADDELL, J. (1946.) **A study of the requirements of White Leghorn chicks for new and unidentified members of the vitamin B complex.**—*J. biol. Chem.* **162.** 477–489. **397**

A folic acid deficiency produced in growing chicks fed a purified diet containing all the known nutritive factors except folic acid was characterized by poor feathering, poor growth and severe macrocytic hyperchromic anaemia, the majority of the chicks dying in four weeks. Symptoms could be prevented by the administration of yeast concentrates containing 22–44 μg. of vitamin B_c. A crude yeast extract and the liver fraction L (from the Wilson Laboratories) were equally effective.

The administration of 50 μg. of *Lactobacillus casei* ϵ factor had only slight effect and neither 4- nor 5-pyridoxic acid was effective when administered alone. When 4-pyridoxic acid and *Lactobacillus casei* ϵ factor were given simultaneously, there was distinct improvement in the growth of the chicks and the anaemia was lessened. However, the effect was comparatively smaller than that obtained when equal or lesser amounts of vitamin B_c were administered in yeast concentrates. The authors suggest that there may be other compounds which are low in potential vitamin B_c activity for micro-organisms, but highly active for chicks on this basal diet.—E. K.

LOWRY, O. H., & BESSEY, O. A. (1945.) **The effects of light, trauma, riboflavin, and ariboflavinosis on the production of corneal vascularity and on healing of corneal lesions.**—*J. Nutrit.* **30.** 285–292. **398**

The rate of capillary ingrowth and other corneal changes were compared in four groups of rats maintained on (a) a normal diet and kept in the dark, (b) a normal diet and kept in continuous light, (c) a riboflavin-deficient diet and kept in the dark and (d) a riboflavin-deficient diet and kept in continuous light. The rate of repair of injuries to the cornea caused by ultraviolet light, by removal of the corneal epithelium, or by nitric acid was also assessed in groups of rats kept under these conditions.

Brilliant light did not increase the corneal and conjunctival changes resulting from a riboflavin deficiency. Continuous illumination and riboflavin deficiency impaired the healing of an epithelial injury due to a mild trauma, but neither of these two factors alone affected the rate of healing. Brilliant continuous illumination and a protracted riboflavin deficiency retarded healing of injuries resulting from ultraviolet light. High riboflavin intake did not prevent " spontaneous corneal vascularization " occurring in normally nourished rats.—E. KODICEK.

See also absts. **506** (science and nutrition), **507** (nutrition and physical degeneration), **278** (vitamin A in TB.), **344** (folic acid and poliomyelitis),

PHYSIOLOGY, ANATOMY AND BIOCHEMISTRY

WHILLIS, J. (1946.) **Movements of the tongue in swallowing.** — *J. Anat.* **80.** 115–116. [Author's summary copied *verbatim.*] **399**

An analysis is made of the movements of the tongue in swallowing by slow-motion cinematography.

In swallowing fluids, two phases are seen. In phase 1 the intrinsic musculature of the tongue is used to squirt the fluid through the mouth. In phase 2 contraction of the mylohyoid bulges the base of the tongue into the oral pharynx.

In swallowing solids phase 2 only is used except when the mouth is being cleared of saliva and debris after the bolus has been swallowed.

RENBOURN, E. T., & BONSALL, F. F. (1946.) **Observations on normal body temperatures in North India.**—*Brit. med. J.* June 15th. 909–914. [Authors' summary copied *verbatim.*] **400**

Using ordinary clinical thermometers, oral and rectal temperatures of both Indian and British troops during the summer months in North India show levels above those accepted as normal for temperate climates. Oral temperatures up to 100·6°F. and rectal temperatures up to 101°F. may occur in apparently normal individuals. The distribution curve of 894 cases is not significantly skewed.

An individual tends to have his own charac-

teristic daily temperature curve, and on a particular day a group of individuals behave in the same way as regards oral and rectal temperatures.

A significant correlation coefficient is not always found between resting oral and rectal temperatures. In a very small percentage of cases the oral temperature may be actually above the rectal.

Analysis of groups of men and several individuals, both British and Indian, suggests a seasonal trend in the mean oral temperature, which tends to follow the range of air temperature.

Exercise in the rain may cause a fall in the oral temperature. For many physiological conditions the oral temperature may not be a good index of the internal temperature.

DANIELLI, J. F., & STOCK, A. (1944.) **The structure and permeability of blood capillaries.**—*Biol. Rev.* **19.** 81–94. **401**

In this review the contractility of capillaries and the filtration of substances through their walls are discussed critically. Constriction of capillaries can occur in two ways: by swelling of the endothelial cells, with resulting obstruction of the lumen without decrease of the external diameter of the vessel (this endothelial swelling may involve only a few cells or it may extend throughout whole capillaries) and by contraction of extracapillary cells (Rouget cells, pericytes, adventitial cells), which by their contraction decrease the diameter of the vessel and produce longitudinal folds in its wall.

Filtration through capillaries is controlled in various ways: by mechanical factors (hydrostatic pressure, colloid osmotic pressure), by particulate matter in the blood (platelets), by chemical agents (histamine, adrenaline, leucotaxine, adrenal cortical hormone, metabolites), by local tonus and by dietary factors (deficiency of vitamin C, K or P, or of protein). It is suggested that platelets form a reserve mechanism which, when the vessel wall is damaged, block the " pores " in the cement substance and so prevent escape of red cells and reduce loss of fluid.

The ultrafiltration hypothesis of STARLING (1895) is the most satisfactory explanation of the passage of substances through the capillary wall. No experimental work is incompatible with the hypothesis and the conclusion that there is a gradient of permeability to dyes is to be considered a misunderstanding of the experimental observations. The rate of development of oedema in perfused preparations obeys Poiseuille's equation and Starling's hypothesis. Most substances reach the tissue cells by filtration, but a few easily diffusible ones, such as oxygen, carbon dioxide and lactate, reach the tissue cells by diffusion through the endothelial cells themselves.—E. G. WHITE.

YOUNG, J. Z. (1946.) **Effects of use and disuse on nerve and muscle.**—*Lancet.* **251.** 109–118. **402**

Y. reviews the work of the last few years and deals with the regeneration of peripheral nerves, the connexion between muscle and nerve and the causes of atrophy and hypertrophy of muscle tissue. Muscle undergoes atrophy if it receives too little direction from above, as after total denervation, or if it is left relaxed and cannot contract against resistance. Hypertrophy occurs if muscle is worked harder from above (nervous system) or from below (increased resistance). As with other tissues, the blood supply of a muscle is also of importance in affecting its size.

—E. G. WHITE.

LARDY, H. A., & PHILLIPS, P. H. (1945.) **Studies of fat and carbohydrate oxidation in mammalian spermatozoa.**—*Arch. Biochem.* **6.** 53–61. **403**

In studies made to determine the utilization of various intermediary metabolites by bull spermatozoa, respiration and sperm motility were used as criteria of the ability of these substances to furnish energy under various experimental conditions. Normal malonate-treated, and 2,4–dinitrophenol-treated ejaculated spermatozoa were able to use glucose, pyruvate and *l*-lactate, but succinate, fumarate and malate were not used by normal spermatozoa, although these 4-carbon acids and oxalacetate were effective in reversing the inhibition of motility and respiration in spermatozoa caused by malonate. The respiration and motility of normal bull spermatozoa were increased by oxalacetate and the latter was the only 4-carbon acid effective in increasing respiration and supporting motility of dinitrophenol-treated spermatozoa, possibly as a result of its decarboxylation to pyruvate.

Although egg phospholipoids increased respiration and prolonged motility in normal spermatozoa, they were without effect in malonate and dinitrophenol inhibition of respiration and motility. Acetate, acetoacetate and β-hydroxybutyrate did not stimulate respiration but prolonged motility. They supported both respiration and motility of dinitrophenol-treated spermatozoa. Of these three fat intermediaries, only β-hydroxybutyrate consistently increased respiration and improved the motility of malonate-treated spermatozoa: this can probably be accounted for by its oxidation to acetoacetate.

Acetoin, propionate, butyrate, α-glycerophosphate, α-hydroxyisobutyrate and δ-lactate were not utilized for maintenance of motility. It appears that spermatozoa and enzyme systems therein can synthesize citric acid from pyruvate or oxalacetate under certain conditions. The present data are in agreement with the theory that

both fats and carbohydrates are metabolized through the isocitric acid cycle.—A. EDEN.

COLLERY, L. (1944.) **Note on the sudanophile fat in the testis of the dog.**—*Proc. R. Irish Acad.* Sect. B. **50.** 15–22. **404**

Details are given of the fixation, impregnation and staining of fat from sections of the testis of mature, healthy dogs in attempts to trace the origin and movements of sudanophilic fat within the various cellular components of the testis. The incidence and appearance of fat in the genesis and metamorphosis of sperms may be explained by the observation that the sudanophilic fat in the Sertoli cells is passed to the developing germ cells, where it is transformed into a non-sudanable lipoid, possibly for the synthesis of idiosome or chrondriome; any that is not required for this purpose then reappears in the residual cytoplasm of the spermatid by a process of phanerosis; probably this can be taken up and used once more by the Sertoli cells.—A. EDEN.

BLACK, D. J. G., & BOOTH, R. G. (1946.) **Capon production by the use of synthetic oestrogen (stilboestrol).**—*Vet. J.* **102.** 41–44. **405**

Cockerels 17 weeks old were divided into two groups of 15 and 16 birds respectively, those in one pen receiving an addition of stilboestrol in the mash at the rate of 1 mg. rising to 1·5 mg. per bird per day over a period of seven weeks. The birds in the other pen served as controls. An improvement was observed in the utilization of food by the oestrogen-fed birds. The testicles were weighed and those of the treated birds were found to be less than half the size of those in the control group; there were other changes simulating in every respect the effects of caponization.

It was considered that the optimal results were not obtained in these experiments: it remains to be shown which synthetic oestrogen is most effective for fattening poultry and in what form and at what stage of the fattening process it should be fed.—J. D. BLAXLAND.

REIBEL, J. (1943.) Cronometria dentaria de los bovinos Shorthorns argentinos desde 12 a 44 meses. **[Study of the teeth in Argentine cattle 12-44 months old.]**—*1er Congr. Méd. vet. Prov. B. Aires, 1946.* pp. 483–485. **406**

R. studied the dentition of over 2,000 Shorthorn bulls, and compared his findings with the ages of these bulls as given in the Argentinian herd book.

R. found the following more accurate as a guide to age estimation than the usual description. At 12–16 months, the central and 1st intermediate temporary incisors are in wear. At 16–19 months they are well worn and the 2nd intermediate and corner incisors are slightly worn. At 19–24 months, there are 6–7 milk teeth left. At 24–29 months, 4–5 milk teeth are still present. At 29–34 months, 2–3 milk teeth remain. At 34–39 months, only one milk tooth is present, or all eight have been replaced, and the central and 1st intermediate permanent incisors are slightly worn. At 39–44 months, the central and 1st intermediate permanent teeth are well worn and the 2nd intermediate and corners are coming into wear.

—I. W. JENNINGS.

See also absts. **351** (genetics and immunity), **408** (reproduction), **508** (endocrinology and pregnancy), **509** (chemical embryology).

POISONS AND POISONING

*KOVÁCS, J. (1942.) **[Investigation in cases of poisoning.]**—*Közl. Összehas. élet- és kórtan Köréből.* **30.** No. 7. [Abst. from abst. in *Berl. Münch. tierärztl. Wschr./Wien. tierärztl. Mschr.* April 14th. 128. (1944).] **407**

K. gives a general account of the subject. An instance in which cattle were poisoned by barium chloride administered in mistake for epsom salts is recorded.—E. M. CRUICKSHANK.

DALLDORF, G., & WILLIAMS, R. R. (1945.) **Impairment of reproduction in rats by ingestion of lead.**—*Science.* **102.** 668–670. **408**

Accidental inclusion in the diet of rats of metallic lead in amounts varying from 0·5 to 12 mg. per 100 g. food resulted in very high mortality in the young of the second generation, 20–80% dying at birth or within 1–2 days. In addition, some five males and seven females from a total of 78 pairs became sterile and from time to time some contracted what appeared to be pulmonary disease, 13 cases proving fatal. Histological examination of the kidneys revealed that acidophilic inclusion bodies were numerous in the epithelium of the convoluted tubules of every animal that died. An attempt to transmit the inclusions to animals fed a standard diet gave negative results. Increased lead values were found in the liver and kidney tissue of some of the rats examined.—R. ALLCROFT.

BLAXLAND, J. D. (1946.) **The toxicity of sodium chloride for fowls.**—*Vet. J.* **102.** 157–173. **409**

Experiments were carried out to determine the toxicity of NaCl for mature fowls, growing chickens and baby chicks. Adult birds were killed by doses of 4 g. NaCl per kg. body weight introduced directly into the crop, but the same dose levels incorporated with the mash and consumed normally failed to induce death. When

amounts of NaCl comprising 5, 10, 15 and 20% of the ration were fed to adult birds over a four-weekly period no deaths occurred. Mashes containing 15, 20 and 30% NaCl fed to groups of adult birds in single feeds produced fatalities in individual cases only, although such mashes were relatively unpalatable and not very readily consumed. The symptoms accompanying the ingestion of high amounts of salt were excessive thirst and diarrhoea, but in non-fatal cases these symptoms readily disappeared after the birds were again offered a normal diet.

A low mortality rate was found in growing chicks fed mashes containing 5, 10 and 15% NaCl for a fortnight. Such birds reflected the varying levels of salt in their diet by diminishing rates of growth. The explanation of this may lie as much in a diminished food intake as in a specific effect of NaCl.

Heavy mortality accompanied the feeding of mashes containing 5% and 10% NaCl to baby chicks within the first week. Groups of baby chicks were killed within five days by giving them normal saline or a 2% solution of NaCl in place of drinking water. On P.M. examination such chicks had distinct generalized tissue oedema and congestion of the viscera in contradistinction to the inconclusive and non-diagnostic features of the P.M. findings in adult birds poisoned by NaCl.

The significance of these observations is discussed in relation to cases of reputed NaCl poisoning encountered in routine diagnostic practice.—A. Eden.

Figge, H. J., Carey, T. N., & Weiland, G. S. (1946.) **Studies on the toxicity of sulfonamide drugs. I. Porphyrin-excretion by a patient treated with sulfadiazine and later with sulfanilamide.**—*J. Lab. clin. Med.* **31.** 752–756. [Authors' summary and conclusions copied *verbatim.*] **410**

The fact that sulfonamide therapy frequently gives rise to a mild and variable porphyrinuria has been confirmed by semiquantitative observations on forty patients. In a careful study of the urinary porphyrins of one of these, it was observed that the administration of either sulfadiazine or sulfanilamide to the same patient at different times gave rise to the excretion of abnormal amounts of the same kind and type of porphyrin, coproporphyrin III. The amount of porphyrin excreted during sulfadiazine treatment was less than when a similar dose of sulfanilamide was administered. The amounts of porphyrin excreted in this case paralleled the relative toxicity of the two drugs. Since aniline, lead salts, sulfonal, and other similar compounds give rise to porphyrinuria, but presumably have no bacteriostatic action. the coproporphyrin III is probably one of the coincidental by-products of sulfonamide action.

Van der Walt, S. J. (1944.) **Some aspects of the toxicology of hydrocyanic acid in ruminants.** —*Onderstepoort J. vet. Sci.* **19.** 79–160. **411**

Methods available for the quantitative determination of free hydrocyanic acid in biological material are reviewed and the accurate and sensitive ferric thiocyanate method developed by the author is described in detail.

By using this method, hydrocyanic acid was demonstrated in a wide range of plants growing in the Union of South Africa. Of the factors responsible for the variability of hydrocyanic acid content of plants, climatic conditions were shown to be of chief importance; wilting results in an especially marked increase.

Diagnosis of poisoning, made on the basis of the chemical analysis of organs of affected animals, was complicated by the finding of hydrocyanic acid in the ruminal contents of animals which died, under field conditions, from causes other than such poisoning. Experiments on sheep given HCN *per os* showed that, of the organs analysed, the ruminal contents and the liver contained the highest concentrations and that the amounts present in these organs were indicative of the amount of hydrocyanic acid ingested. The author regards the concentration in the liver as the chief criterion on which to base a diagnosis, that of the ruminal contents serving as corroborative evidence. Provisional levels, for sheep receiving lethal doses of hydrocyanic acid, are 0·14 mg. or more per 100 g. for the liver, and 1·0 mg. or more for the ruminal contents. The rapid decrease in hydrocyanic acid content of liver and ruminal contents which occurs on storage was found to be entirely preventable by the use of mercuric chloride. A routine treatment of field samples, based on this finding, is worked out.

In work on the repeated ingestion of sublethal doses, the author was unable to demonstrate a chronic form of hydrocyanic acid poisoning in sheep.—H. Paver.

Wagnon, K. A., & Hart, G. H. (1945.) **Durango root (Datisca glomerata) poisoning of range stock.**—*J. Amer. vet. med. Ass.* **107.** 3–5. **412**

An outbreak of poisoning in cattle in California, in which there were five deaths and severe diarrhoea in several other animals, was believed to be associated with the ingestion of durango root, grazing of which occurred as a result of the depletion of natural dry forage resources of the area.

Feeding tests for toxicity are described for both sheep and cattle. Sublethal doses result in

diarrhoea, loss of appetite and general depression. Because of the great difficulty found in inducing sheep to eat the plant, it is considered unlikely that lethal amounts would be consumed by this species under natural range conditions.

250–275 g. of dry leaves and seed capsules proved lethal to a heifer (weight 750 lb.), and to a heifer calf (weight 400 lb.). P.M. examination revealed severe gastro-intestinal irritation. Death was believed to be due to some toxic substance in the plant, with systemic effects which acted upon the nerve centres.—H. PAVER.

See also abst. **355** (tick paralysis).

PHARMACOLOGY, THERAPEUTICS AND DISINFECTION

KRAMER, S. D., & BUNCH, L. D. (1945.) **The administration of certain chemotherapeutic agents to mice by incorporation of the chemical in the drinking water: an evaluation of the method.**—*J. Immunol.* **51.** 15–22. **413**

Tests are described which established that in suitable cases incorporation in drinking water was a satisfactory method of administering drugs to mice for experimental purposes. This was especially so when administration of very low concentrations was required. Solution in the drinking water produced constant blood levels which in some cases were higher than when the drugs were given in the food. Sodium sulphapyridine was employed for the preliminary tests, but later sodium fluoride, iodoacetic acid, benzedrine sulphate, sodium arsenate, phenol, bromacetic acid and phenylmercuric nitrate were also tested. All of these were too toxic to be administered in the diet at a concentration of more than 0·1%, but satisfactory results were obtained when they were given by solution in the drinking water.
—D. D. OGILVIE.

TREFFERS, H. P. (1946.) **Studies on resistance to antibiotics. I. The action of penicillin on some Gram-positive and Gram-negative organisms and its potentiation by various inhibitors.**—*Yale J. Biol. Med.* **18.** 609–623. [Author's summary copied *verbatim.*] **414**

Iodoacetic acid, sodium azide, gentian violet, merthiolate, and a variety of other agents have been shown to potentiate the inhibitory action of penicillin.

Among the micro-organisms affected by one or more of these combinations are *S. dysenteriae*, *S. ambigua*, *E. coli*, *Staph. aureus*, *B. cereus*, and hemolytic and non-hemolytic streptococci. Only a single strain of each has been examined.

A penicillin-resistant variant has been shown to react to the penicillin-inhibitor combination in proportion to its increased resistance to penicillin.

Although a number of the agents listed are known to affect penicillinase under proper conditions, evidence is presented that the mechanism of the potentiating agent need not involve penicillinase inhibition.

CURRAN, H. R., & EVANS, F. R. (1946.) **The activity of penicillin in relation to bacterial spores and the preservation of milk.**—*J. Bact.* **52.** 89–98. [Authors' summary copied *verbatim.*] **415**

A study was made of the preserving action of penicillin in milk containing viable bacterial spores. Fifteen aerobic and two anaerobic species were examined.

In their reaction to penicillin, *Bacillus cereus*, *Bacillus mycoides*, *Bacillus albolactis*, and *Bacillus metiens* were relatively resistant. When they were present penicillin was not an effective preserving agent except in concentrations that would be impracticable. The remaining 13 species were relatively susceptible to penicillin as was manifested by strong sporicidal or prolonged sporistatic activity in a drug concentration of 5 u. per ml. This concentration sterilized many of these cultures.

Five units per ml of penicillin greatly delayed but did not prevent spoilage by *Clostridium botulinum* and an unidentified anaerobic species (3679). In the former, toxin formation accompanied spoilage, both in the control and penicillin samples. The sporistatic period varied with the concentration of spores and the level of penicillin. The data indicate that an extremely small proportion of the spores of *Clostridium botulinum* are highly resistant to the sporistatic action of penicillin.

The evidence suggests that all spore cultures contain spores susceptible to penicillin, the species differing in the relative proportion of resistant and sensitive cells.

On the basis of this study, it is concluded that penicillin has no application in the preservation of food. In combination with mild heating, it might have utility as a preservative or spoilage-delaying agent in certain non-food materials.

EAGLE, H. (1946.) **The relative activity of penicillins F, G, K, and X against spirochetes and streptococci in vitro.**—*J. Bact.* **52.** 81–88. [Author's summary copied *verbatim.*] **416**

Two lots of crystalline penicillin F, three lots of G, one of K, and three of X have been assayed for streptococcidal activity (group A hemolytic

streptococcus, C-203) and spirocheticidal activity (*Spirochaeta pallida*, Reiter strain) *in vitro*.

The relative activities per mg. of these crystalline preparations against the streptococcus averaged 82, 100, 120, and 140 for F, G, K, and X, respectively, in one series of assays, and 70, 100, 110, and 130 in a second series. The corresponding activities against the spirochete were 53, 100, 76, and 51, respectively. In comparison, the relative activity of these four penicillins against *Staphylococcus aureus* are stated to be 90, 100, 138, and 54.

Per (staphylococcidal) "unit", the activities of F, G, K, and X against the streptococcus averaged 85, 100, 85, and 250, and against the spirochete, 60, 100, 55, and 95.

With each of the three organisms there was therefore approximately a twofold difference between the least active and most active penicillin; but their relative activity varied unpredictably from organism to organism. The order of increasing activity was X < F < G < K for *Staphylococcus aureus*, F < G < K < X for the streptococcus here studied, and X = F < K < G for the spirochete.

The therapeutic significance of these data is discussed in the text.

THOMPSON, R., & SHIBUYA, M. (1946.) **The inhibitory action of saliva on the diphtheria bacillus: the antibiotic effect of salivary streptococci.**—*J. Bact.* **51.** 671–687. **417**

The authors attempt to clarify the role played by the salivary bacteria in the inhibitory action of saliva on the diphtheria bacillus. They show that these organisms are all streptococci mainly of the *mitis* type. In experiments in which saliva was treated in various ways to eliminate the bacteria, its inhibitory power was found to have been lost. The contention that larger numbers of bacteria than occurred in normal saliva are necessary to cause inhibition is denied. Similar inhibitory effects were produced when pure cultures of *Str. mitis* were used as with saliva.—C. D. WILSON.

NIEMAND, H. G. (1943.) Über Sulfonamide und ihre Resorption beim Pferde. **[Sulphonamide chemotherapy in horses.]**—*Z. Veterinärk.* **55.** 29–50. **418**

This paper gives original information on the drug concentration in the blood of horses after a single dose by stomach tube of prontalbin [sulphanilamide], eubasin [sulphapyridine], cibazol or eleudron [sulphathiazole], pyrimal [sulphadiazine], globucid [sulphathiodiazole], albucid [sulphacetamide] and a new compound called salthion; details are also given for eight horses which received a series of doses of eubasin.

It was found that prontalbin and globucid reached their maximal concentration in the blood about one hour after ingestion of 0·089 g. per kg., with 8 and 4 mg. % of free drug respectively. All the others reached their peaks about 3–8 hours after administration, the above dosage producing blood levels of 5 mg. % or less. Albucid was in a class by itself for low blood concentration as a result of its very rapid excretion and achieved only a peak of 0·4 mg. % in six hours. Salthion was poorly absorbed and a dosage of 0·5 g. per kg. was required to produce a blood level of 2·8 mg. % in six hours.

Eubasin was given by stomach tube three times daily for five days, in various schedules from 15 g. daily (total 75 g.) to 30 g. daily (150 g.) and produced, maximal blood levels of 2–4·8 mg. %, which were therapeutically suboptimal. A thrice-daily dose of 15 g. is suggested for routine use.

For the treatment of equine infectious bronchitis eubasin in this dosage should be effective, but pyrimal may be better. Treatment by intratracheal injection is possible, but questionably desirable, as the blood stream is the best route to any vascular organ of the body. Strangles responds poorly to prontalbin; eubasin is more effective, but pyrimal is expected to be best. [During the three years since publication of this article, the leading position of the sulphapyrimidines has been confirmed.]—J. E.

ROBERTS, S. J. (1945.) **Treatment of strangles in a horse with penicillin and sulfamerazine.**—*Cornell Vet.* **35.** 378–381. **419**

Rapid recovery of a seven-year-old horse with strangles followed treatment with sulphamerazine and penicillin. Sulphamerazine was administered orally for eight days in an initial dose of 32 g. followed by daily amounts varying from 48 g. to 16 g. given in three doses. Penicillin was administered intravenously at a dose of 300,000 Oxford units on the day sulphamerazine treatment began, followed the next day by 100,000 Oxford units intramuscularly and further similar doses at short intervals until a total of 1,700,000 Oxford units had been given over a period of 48 hours.

—H. WILLIAMS SMITH.

SCHOFIELD, F. W. (1946.) **Penicillin in the treatment of bovine mastitis.**—*Canad. J. comp. Med.* **10.** 63–70. [French summary.] **420**

The results are reported of the use of penicillin in both acute and chronic mastitis and in various kinds of bacterial infection.

In an attempt to determine an effective dose various amounts of penicillin were administered and the milk was assayed after stated intervals. In dry quarters an average of 0·44 units was recovered 24 hours after the administration of 25,000 units in 200 ml. sterile water. Recent tests using 50,000 units yielded approximately 2·5 units.

A table gives the percentage of infection removed after infusing penicillin in doses of 25,000, 50,000 and 100,000 units dissolved in 200 ml. of sterile water. Results, varying from nil to 75% are correlated with the causative agent and type of infection, whether spreading, dormant, acute or chronic, and S. concludes that the result of treatment depends more upon the type of infection than upon the amount of penicillin infused and the frequency of treatment. *Staphylococcus aureus* and *Corynebacterium pyogenes* were most resistant to penicillin. *Streptococcus pyogenes* infection responded favourably to treatment, except when the gland damage was of long standing. The most satisfactory dosage and frequency of treatment were not decided, but best results were obtained when 50,000 units were administered every 12 hours for three days in cows being milked. Quarters were not considered cured unless they were shown to be free of infection for three weeks; for examination, incubated milk samples were cultured on blood agar.

Significant deductions are made that *Streptococcus agalactiae* is more resistant to penicillin in acute outbreaks of mastitis than when the organism is present in the udder unaccompanied by clinical manifestations, and that the infection may resist treatment even when the drug is administered with dosage and frequency sufficient to induce a reasonable level of inhibition.—J. W. P.

WEIRETHER, F. J., JASPER, D. E., & PETERSEN, W. E. (1945.) **Effect of infused penicillin in the bovine mammary gland.**—*Proc. Soc. exp. Biol., N.Y.* **59.** 282–286. **421**

Doses of up to 200,000 Oxford units of penicillin in as much as 950 ml. water were infused into the mammary glands of cattle with coliform mastitis without producing either favourable or unfavourable results. Most of the infused penicillin was excreted in the milk and urine during the 24 hours following infusion.—E. BOYLAND.

YOUMANS, G. P., & MCCARTER, J. C. (1945.) **Streptomycin in experimental tuberculosis. Its effect on tuberculous infections in mice produced by** *M. Tuberculosis var. Hominis.*—*Amer. Rev. Tuberc.* **52.** 432–439. [Spanish summary.] [English summary copied *verbatim.*] **422**

Streptomycin hydrochloride administered subcutaneously had a marked suppressive effect on experimental pulmonary tuberculosis in mice. The use of mice for testing the effect of chemotherapeutic agents on experimental tuberculosis is discussed.

SHPANIR, F. L., & CHERTKOVA, E. I. (1944.) Issledovaniya khimioterapevticheskikh svoĭstv nekotorykh amidov α-furankarbonovoĭ kisloty pri tuberkuleze. **[Investigations on the chemotherapeutic properties of some amido-compounds of α-furancarbonic acid in tuberculosis].**—*Probl. tuberk.* No. 4. pp. 9–15. [Abst. in *Amer. Rev. Tuberc.* **52.** No. 3. p. 48 of absts., copied *verbatim.* Signed: V. K. LEITES.] **423**

The evaluation of a specific chemotherapeutic agent can be based up to a certain extent on the changes produced by it on the vitality of tubercle bacilli *in vivo*. The present study was based on the following method: the infectious agent was a tubercle bacillus of the human type, growing rapidly *in vitro*, and having conserved its virulence for guinea pigs, rabbits and mice. The experimental animal was the white mouse. The intravenous route of infection was used. The dose of infection was 0·5 mg. of a two-week old culture. The chemotherapeutic products were injected intramuscularly in oily suspension, the dose being somewhat below the maximal. Ten injections were given within two weeks. The evaluation of the results was as follows: suspensions of parenchymatous organs of 30 tuberculous white mice were cultured on Löwenstein's medium, 15 mice having received the chemotherapeutic agent and 15 serving as controls. The frequency of positive and negative cultures obtained from treated and control animals was compared. The authors have studied the chemotherapeutic properties of amido-compounds other than the sulfonamides and not containing sulfur. The investigated substances were amido-compounds of α-furancarbonic acid differing in the presence of the following groups: butyl, iso-butyl, heptyl, dimethyl, dipropyl, dibutyl, di-isobutyl, benzyl, methyl-benzyl, propyl-benzyl, iso-butylbenzyl, dibenzyl, anilid. Of these investigated compounds the benzylamid of α-furancarbonic acid showed the most pronounced activity in animals and appeared to be of low toxicity. Its administration in tuberculous mice resulted in a negative culture from their organs in 45 per cent of cases, whereas negative cultures with other amido-compounds were only found in 11 to 38 per cent. of cases. These products were also studied in reference to their properties *in vitro* and also here the benzyl compound showed the most marked bactericidal and bacteriostatic effect.

VAN ES, L., OLNEY, J. F., & BLORE, I. C. (1945.) **The effects of penicillin on** *E. rhusiopathiae* **infected pigeons.**—*Res. Bull. Neb. agric. Exp. Sta.* No. 141. pp. 15. **424**

A series of experiments to determine whether or not *E. rhusiopathiae* is sensitive to penicillin are described. As swine cannot be readily infected experimentally, the authors used pigeons. The experiments showed that the organism was

sensitive to penicillin and confirmed the results of HEILMANN & HERRELL [*V. B.* **16.** 203]. Pigeons cured by penicillin were found to have acquired some immunity. Repeated injections were necessary to obtain the best results, a fact which is considered to limit the use of penicillin in treatment of natural infections in swine.—M. C.

*STERN, L. (1943.) **[New methods of treating tetanus.]**—*Voks Bull. Moscow.* No. 7. pp. 23–24. [Abst. in *Bull. Hyg., Lond.* **19.** 972, copied *verbatim.* Signed: CHARLES WILCOCKS.] **425**

In this brief account, Academician Lina Stern argues that although tetanus toxin passes the blood-brain barrier, its antitoxin cannot do so, and that the damage done when the toxin reaches the brain and spinal cord is irreversible largely because the antitoxin cannot, by ordinary methods of injection, be brought into sufficiently close association with the toxin. Experiments on animals showed that intracisternal introduction of antitoxin would halt the process of [presumably] otherwise fatal tetanus, provided that it was administered within a reasonable time, the length of which is not stated in this short note. Treatment of developed tetanus in man, by repeated intracisternal injection of antitoxin, in amounts much smaller than those normally given by other routes, has been successful in a number of cases, and the author makes the claim that " the application of this method practically fully guarantees the complete cure of tetanus, even in cases which have heretofore been considered as hopeless. . . . The technique of its application is simple and can be employed under any conditions ". [Readers will recall the same author's intracisternal treatment of shock (Bulletin of War Medicine, 1943, v. 3, 328); no doubt the same technique is used for the treatment of tetanus. The method is not new; it was described by YODH (Brit. Med. J., 1932, Sept. 24, 589), who demonstrated its value, but advocated combined intracisternal, intravenous and intramuscular injection. The subject is discussed in TOPLEY and WILSON's Principles of Bacteriology and Immunity, Second Edition, 1936, pp. 1938 et seq.]

EAGLE, H. (1946.) **The treatment of trypanosomiasis with *p*-arsenosophenylbutyric acid. I. Results in 319 cases of early *Trypanosoma gambiense* infections.**—*Publ. Hlth Rep., Wash.* **61.** 1019–1034. **426**

The cases of human sleeping sickness on which this article is based were treated in six different West African territories with varying doses of the drug, administered at intervals varying from one day to one week by both the intravenous and intramuscular routes. It is also stated that the methods of estimating the involvement of the central nervous system were not always accurate and that cases in which treatment is recorded as a failure on account of rises in the cell content of the spinal fluid cannot always be accepted.

It is concluded that of 156 known early cases of sleeping sickness treated with a total of 3·5 mg. or more per kg. body weight, 146 have remained well to date, and that early infections may be cured within two weeks by 12–14 daily injections of 0·5 mg. per kg., or within one week by 6–7 injections of 1·0 mg. per kg. The sole factor determining therapeutic efficiency was the total amount of the drug given. It is suggested that this holds good for trypanosome infections in which multiplication is slow, but for rapidly multiplying infections the total curative dose is greater the longer the time interval between individual injections.

Some patients were injected in error with approximately 2 mg. per kg. repeated daily for five and ten days without toxic reactions, and in one case an " arsenic-fast " infection yielded to six treatments, the total dose being 3·6 mg. per kg.

A table gives the results of drug tests on other trypanosome infections, from which it appears that the drug is ineffective against *T. congolense* and *T. cruzi* infections in mice and against *T. equiperdum* infections in equines.—U. F. RICHARDSON.

CHEN, G., GEILING, E. M. K., & MACHATTON, R. M. (1945.) **The effect of cysteine on the trypanocidal activity and toxicity of antimonials.** —*J. infect. Dis.* **76.** 152–154. **427**

Cysteine hydrochloride neutralized with trisodium phosphate just prior to injection and given intramuscularly to mice on the second day after inoculation with *Trypanosoma equiperdum*, reduced both the trypanocidal activity and toxicity of trivalent antimony compounds (tartar emetic, fuadin, etc.), but did not affect the action of pentavalent antimony compounds (stibenyl, stibamine). Cysteine has also been found to antagonize the inhibitory effect of both tartar emetic and stibamine on the glucose metabolism of trypanosomes *in vitro.*

It is suggested that the trivalent antimony compounds may exert their effect by interference with cellular respiration.—U. F. RICHARDSON.

BRUMPT, L. C. (1942–1943.) Le traitement des coccidioses des animaux domestiques par la quinacrine ou atébrine. **[Treatment of coccidiosis in domestic animals with atebrin].**—*Ann. Parasit. hum. comp.* **19.** 97–115. **428**

Quinacrine proved efficacious in the treatment of various forms of coccidiosis. Good results were obtained in the treatment of infected cats, rabbits and cattle and B. believes that the

drug will prove of equal value in coccidiosis of other domestic and wild animals. The effective dosage for cats and cattle was 0·01 g. per kg. live weight, but if necessary it might be increased in the case of the rabbit, cat, dog, pigeon and fowl, as these will tolerate ten times this dosage for 4–5 days.—C. Horton Smith.

Coggeshall, L. T., Porter, R. J., & Laird, R. L. (1944.) **Prophylactic and curative effects of certain sulfonamide compounds on exoerythrocytic stages in *Plasmodium gallinaceum* malaria.** —*Proc. Soc. exp. Biol., N.Y.* **57.** 286–292. **429**

Exo-erythrocytic schizonts of *Plasmodium gallinaceum* have been found to be refractory to quinine and atebrin. As these stages are found only occasionally in the circulating blood it has been difficult to study their development and their response to chemotherapy. The difficulty has now been overcome by using a biopsy technique which enables multiple examinations to be made of brain tissue in individual animals. Exo-erythrocytic forms are most easily found in the brain capillaries. A 0·25 ml. syringe containing 0·02 ml. of saline and fitted with a 20-gauge needle is inserted into the cortex of the cerebrum and rotated through 360°. Slight suction is applied at the same time and upon removal of the needle a satisfactory sample of brain tissue can be obtained. By adopting this means it was found that sulphadiazine prevents the appearance of these forms. Sulphadiazine or sulphapyrazine will effect a cure and cause the exo-erythrocytic schizonts to disappear. It is confirmed that quinine and atebrin have no prophylactic or curative action.—C. H. S.

Seeler, A. O. (1945.) **The inhibitory effect of pyridoxine on the activity of quinine and atabrine against avian malaria.**—*J. nat. Malar. Soc.* **4.** 13–19. **430**

Sulphonamides probably act by competing with *p*-aminobenzoic acid or a compound of similar nature for a position in the metabolism of the bacterial cell. On this parallel, malaria plasmodia probably need some factors known to be required by other forms of life. S. assumes as a working hypothesis, that atebrin and quinine act by competition with some factor required in the metabolism of the malaria parasite. Studies were made on the effect of larger amounts of vitamins on the activity of these drugs in avian malaria. The present paper shows that pyridoxine in massive doses of 500 mg. per kg. body weight *per os* or 200 mg. per kg. subcutaneously inhibits the activity of minimal effective doses of quinine and atebrin against *Plasmodium lophurae* and *P. cathemerium* infections of ducklings. The doses of pyridoxine administered were always the same, but the amounts of atebrin and quinine used were varied according to the susceptibility of the species of parasite used. Graded doses of drugs were also used to study the quantitative relationship between pyridoxine and the antimalarials. Administration of pyridoxine to mice receiving atebrin and quinine did not influence the acute oral toxicity of the drugs.—C. Horton Smith.

Rigdon, R. H., & Rudisell, H., Jr. (1945.) **Effect of radiation on malaria. An experimental study in the chick and duck.**—*Proc. Soc. exp. Biol., N.Y.* **59.** 167–170. **431**

Comparisons between the variations in the development of parasitaemia in chicks inoculated with irradiated blood and in control chicks showed that X-rays injure *Plasmodium lophurae.* Treatment with 2,000 r. preceding inoculation markedly reduced the numbers of reproducing parasites. All parasites appeared to be destroyed on treatment of parasitized blood with 15,754 r. *In vivo* study of the effects of X-rays on *P. lophurae* indicates that this irradiation also injures *P. lophurae.* As many chicks died as a result of the irradiation necessary to injure the parasites, the practical applications of this type of therapy are negligible. Radium bromide used in these experiments had no effect on *P. lophurae* but severe degenerative changes occurred in the treated birds.—C. H. S.

Harford, C. G., Smith, M. R., & Wood, W. B., Jr. (1946.) **Sulfonamide chemotherapy of combined infection with influenza virus and bacteria.**—*J. exp. Med.* **83.** 505–518. [Authors' summary and conclusions copied *verbatim.*] **432**

Sulfonamide chemotherapy controls the bacterial component of combined infection with influenza virus and pneumococci in rats. Reinstillation of fluid (broth, physiological salt solution) into the respiratory passages of mice several days after sublethal viral infection converts the viral infection into a lethal one. Sulfonamide chemotherapy controls the bacterial component of combined bacterial and viral infection of mice, produced by intrabronchial inoculation of mixtures of bacteria and sublethal or lethal doses of virus.

Bacterial pneumonia may be superimposed upon sublethal viral infection in mice by inhalation of fine droplets of bacterial suspension several days after inoculation of virus. Normal mice inhaling fine droplets of bacterial suspension fail to develop obvious disease. Sulfonamide chemotherapy controls bacterial pneumonia superimposed on sublethal viral infection by inhalation of fine droplets of bacterial culture. The secondary bacterial pneumonia does not convert the sublethal viral infection into a lethal one.

If another pandemic of influenza occurs, it is probable that sulfonamide chemotherapy will be

valuable in the treatment of secondary bacterial pneumonia and will be effective in lowering the case fatality rate if the viral component of the infection is not severe enough by itself to cause death.

CHRISTOPHERS, R. (1945.) **Insect repellents.**—*Brit. med. Bull.* **3.** 222–224. **433**

Repellents are defined as substances which prevent insects from biting, it being immaterial whether the insects are killed or not. A general description is given of the early work on repellents and on methods of testing, formulation and use of these substances.—W. MOORE.

GRANETT, P., & HAYNES, H. L. (1945.) **Insect-repellent properties of 2-ethylhexanediol-1,3.**—*J. econ. Ent.* **38.** 671–675. **434**

Extensive laboratory and field trials show that 2-ethylhexanediol-1,3 [Rutgers no. 612] possesses highly effective repellent properties against a variety of insect pests. With the exception of *Anopheles quadrimaculatus* it is more efficient than di-methyl phthalate against mosquitoes, and much more efficient against *Stomoxys calcitrans.*

The substance is easy and pleasant to use, stable in storage or use, and safe and non-irritant to the skin.—W. MOORE.

CRAUFURD-BENSON, H. J. (1945.) **Modern developments in fly control.**—*Brit. med. Bull.* **3.** 224–227. **435**

The methods of fly control are reviewed especially as applied to sanitation problems under active service conditions. The introduction of persistent insecticides such as D.D.T. and benzene hexachloride has opened up new ways of dealing with the fly problem. It has, however, been found that these are only supplementary to the standard methods of fly prevention such as disposal of refuse, incineration, etc.

The residual sprays open up prospects of complete eradication of flies, as one treatment is effective for many weeks. Practical experience has shown that certain principles must be observed in their use. (1) The object of residual spraying is to reduce the insect population and not to kill individual insects. This means that all possible resting and hiding places of the fly should be treated. (2) D.D.T. and benzene hexachloride are true insecticides and not merely repellents. (3) The length of persistent action of D.D.T. is dependent upon three interlinked factors, (a) the amount of D.D.T. applied per unit area, (b) the age of the insecticidal film and (c) the duration of contact of the fly with the treated surface.—W. M.

ANON. (1946.) **D.D.T. in general use.**—*Brit. med. J.* August 10th. 203–204. **436**

To obtain good results with D.D.T. in insect control measures, it must be borne in mind that it has no repellent or fumigant action, but that it has great persistent effect. To make full use of this property, the best way of applying D.D.T. against many insects is as a solution in organic solvents, the concentration used depending on the insect involved. Although D.D.T. has a low toxicity to man and other mammals, precautions should be taken by pest control operators when using it.—L. DAVIES.

STOCK, P. G., WILSON, M. U., & BUSVINE, J. R. (1945.) **The use of D.D.T.**—*Mon. Bull. Min. Hlth Emerg. publ. Hlth Lab. Serv.* **4.** 238–242. **437**

This article reviews the use of D.D.T. by health authorities. The more common preparations of D.D.T., including dusting powders, solutions, emulsions, D.D.T.-containing distempers, aerosols and smokes, are described with notes on their production and applications and the dangers attendant upon their use.—R. A. ROPER.

KULASH, W. M., & MAXWELL, J. M. (1945). **DDT and bedbugs in chicken houses.**—*J. econ. Ent.* **38.** 606. **438**

Complete control of *Cimex lectularius* in poultry houses was obtained by spraying the houses, including the nest boxes and exposed portions of feed boxes, with a 5% solution of D.D.T. in kerosene. No live bedbugs were found two months after treatment, even in one house in which the nesting material was heavily infested and was not removed. The D.D.T. had no detrimental effect on the chickens, but after spraying, several dead or dying mice were found.

—W. MOORE.

BLAKESLEE, E. B. (1945.) **DDT surface sprays for control of stablefly breeding in shore deposits or marine grass.**—*J. econ. Ent.* **38.** 548–552. **439**

Tests of light surface sprays of bay-water emulsions of both technical D.D.T. and D.D.T. residual oil, in xylene plus an emulsifier, showed that either of these materials could be used in control of *Stomoxys calcitrans.* This fly causes considerable losses to livestock industry in the northwest coastal areas of Florida, where it breeds in great numbers in the tide-mark deposits of marine grass. Sprays containing 0·5% D.D.T. or 2·5% D.D.T. residual oil, applied at the rate of 2 gal. per 100 sq. ft., caused 90–95% mortality of the emerging adult flies. The same sprays applied at the same rate to uninfested green grass not subject to tide washing protected it from colonization by the fly larvae. Infested grass, treated and subjected to tide-washing, gave an indicated mortality of 90% from the combined effects of spraying and tide-washing. The mortalities in these tests were estimated by comparing

the numbers of flies caught in traps over treated and untreated plots. Spraying long stretches of beach grass deposits in a similar manner gave an indicated control of 84% in heavily tide-washed material, and 90–100% control in deposits not tide-washed.

A pyrophyllite D.D.T. suspension which was tried was found to be inferior in action to the xylene emulsions.—L. DAVIES.

EIDE, P. M., DEONIER, C. C., & BURRELL, R. W. (1945.) **DDT as a culicine larvicide.**—*J. econ. Ent.* **38.** 537–541. **440**

D.D.T. applied as a dust at the rate of 0·8 and 1·6 g. to each of many water barrels infested with the larvae of mosquitoes (mainly *Culex quinquefasciatus*) was more toxic than phenothiazine applied at the same rate. At the higher dosage, D.D.T. prevented breeding in the barrels for well over 100 days. Application of 5·0 p.p.m. of D.D.T. as an emulsion in xylene plus an emulsifier was more effective than applying the dust and prevented breeding in barrels for almost 250 days.

In field tests against the various culicine larvae infesting freshwater ponds and salt marshes in N. America, a suspension of D.D.T. with a commercial solvent gave residual toxicity to larvae for 11 weeks when applied at the rate of 2·0 p.p.m. D.D.T. Both the emulsion and the suspension mentioned above, at 0·05–0·1% D.D.T. gave almost complete initial kills of larvae. The kill given by D.D.T. as a talc dust or in fuel oil was variable, but at concentrations of 0·1–1·0 lb. D.D.T. per acre good initial kills of larvae resulted.

The most effective way of applying D.D.T. as a mosquito larvicide appeared to be as the D.D.T.-xylene emulsion. An added advantage was the small bulk of concentrated emulsion transported to the breeding places, where it was diluted with water before spraying.—L. DAVIES.

FAIRCHILD, G. B., & BARREDA, E. A. (1945.) **DDT as a larvicide against** *Simulium*.—*J. econ. Ent.* **38.** 694–699. **441**

The complete eradication of *Simulium* larvae in swift-flowing mountain streams in Guatemala was effected by concentrations of 1 part D.D.T. to 10 million parts water. The stock emulsion concentrate consisted of 20% D.D.T., 60% xylene, and 20% Triton X-100.—W. MOORE.

I. SQUIBB, R. L. (1945.) Un nuevo sistema para el control de la garrapata en regiones tropicales. [**A new method of tick control in tropical regions.**]—*Rev. Agric., Costa Rica.* **17.** 487–492. **442**

II. SQUIBB, R. L. (1946.) **A new method for the control of cattle ticks in tropical regions.**—*J. Anim. Sci.* **5.** 71–79. **443**

I. This article in Spanish describes the same work as II, except that some of the experimental details are omitted.

II. Having ascertained that mixed solutions of D.D.T. and derris were of value in the control of ticks (*Boophilus annulatus microplus*), S. undertook experiments to find what mixture of the two agents gave the best results and the value of spraying as a method of tick control in the field.

Stock solutions of D.D.T. were made by dissolving 6·16 g. in 66·6 ml. kerosene, and to this was added a solution of 1·8 g. of neutral soap in 33·3 ml. of water. Derris solutions were prepared immediately prior to use and consisted of 22·5 g. green crushed derris root (with a rotenone content of 5%), 200 ml. water and 3 g. neutral soap.

Experimentally the best results were obtained when the two solutions were mixed in equal quantities; 93% tick mortality was recorded on animals sprayed with 100 ml. of the mixture. With the D.D.T. solution alone only 85% of the ticks were killed.

Field tests were carried out in both dry and wet areas of Costa Rica. In the wet area the treated cattle were practically free from ticks within 96 hours of spraying and remained free for about a month, in spite of the fact that a heavy fall of rain occurred four hours after spraying. In the dry area a 94% tick mortality was recorded 120 hours after spraying, and 15 days after spraying the treated cattle carried only 10% of the tick population carried by unsprayed control animals.

Although sprayed cattle lick themselves no poisoning occurred and no skin irritation was observed. The advantages of spraying over dipping are discussed and it is recommended that for tick eradication animals should be sprayed with 80–150 ml. of the mixed solutions at fortnightly intervals.—U. F. RICHARDSON.

CAMPBELL, G. A., HYMAS, F. C., & WEST, T. F. (1945.) **Efficacy of D.D.T. in soap.** [**Correspondence.**]—*Nature, Lond.* **156.** 749. **444**

Washing dogs with warm water and soap containing D.D.T. for 10–15 min., then rinsing and drying in the usual manner gave complete control of both *Ctenocephalus canis* and *Trichodectes canis*. Animals exposed to reinfestation remained free for the duration of observation, *viz*, three months. Chemical analysis showed that there was a deposit of 0·05–0·07% D.D.T. on the hair and the authors comment on the lasting effect of such minute amounts.—W. MOORE.

FIGGE, F. H. J., & WOLFE, G. F. (1945.) **Use of beta beta′ dithiocyano diethyl ether (RID-O) to**

control mite infestations in mice.—*Proc. Soc. exp. Biol., N.Y.* **60.** 136–138. **445**

A proprietary dust containing 7% β,β'-dithiocyanodiethyl ether, when mixed with an equal weight of talc, was found to be very efficient in controlling *Myobia musculii* infestation of mice and was relatively non-toxic to mice. It did not kill eggs or larvae so that the treatment had to be repeated at appropriate intervals.—W. MOORE.

KEARNES, C. W., INGLE, L., & METCALF, R. L. (1945.) **A new chlorinated hydrocarbon insecticide.**—*J. econ. Ent.* **38.** 661–668. **446**

A chlorinated hydrocarbon, "1068", having the empirical formula $C_{10}H_6Cl_8$ has been found to be more toxic to insects than D.D.T. and to compare favourably in toxicity with the pure gamma isomer of benzene hexachloride [gammexane]. The present paper gives the results of a number of comparative laboratory tests with the three products and further data upon the chemical constitution and insecticidal value are promised in the near future.—W. MOORE.

ROARK, R. C. (1946.) **Feeding chemicals to plants and animals for pest control.**—*J. econ. Ent.* **39.** 35–38. **447**

The internal administration of drugs to animals for the control of external parasites, and the injection of chemicals into the sap stream of plants in order to kill the insects feeding on these plants are methods that have received very little notice, but which merit further consideration. Early experiments on the medication of animals for the control of external parasites were unsuccessful, but it must be pointed out that many of the substances tested in this way had little insecticidal action on any species of insect. Recent reports of feeding tests with other chemicals such as D.D.T. fed to rabbits to kill bedbugs, pyrethrum to kill bedbugs and stableflies, and phenothiazine fed to cattle to kill hornfly larvae in manure were very successful. There are now thousands of synthetic compounds known to have high insecticidal properties, and many of these may prove very efficient for internal medication. The fact that substances insoluble in water, such as D.D.T., phenothiazine and the pyrethrins, prove effective when fed to animals suggests new possibilities for the control of external parasites.—W. MOORE.

WETZEL, R., & ELKSNITIS, W. (1943.) Untersuchungen über die Brauchbarkeit des Phenothiazins als Wurmmittel bei Haustieren. [Vorläufige Mitteilung). **[Anthelmintic value of phenothiazine for animals (preliminary paper).]** —*Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 279–280. **448**

In a preliminary experiment a pony was given 8 g. phenothiazine by stomach tube and a horse 30 g. in the food; subsequently 47 horses varying in age from 5–23 years were given 30 g. each in the morning feed. As a result of egg counts and differential larval counts carried out before treatment and 7–30 days after treatment, it was concluded that phenothiazine was almost 100% effective against small strongyles and 80–96% effective against large strongyles. Thirty-fuor of the 47 horses had been more or less severely infested with ascarids, but 37 days after treatment 18 of these 34 (53%) were passing no ascarid eggs in the faeces. There was no action against *Oxyuris equi.*

Eight of the horses receiving 30 g. doses had transitory severe toxic symptoms including extreme fatigue, loss of appetite and icteric mucous membranes, and were incapable of working for several days. One animal, in poor condition, was slaughtered after eight days, but no lesions suggestive of drug action were found. The cause of the toxic effect is not clear, but the authors suggest that catarrhal conditions of the digestive tract may lead to increased absorption of the drug.

Owing to the great economic importance of strongylosis to horse breeders in Germany, the authors recommend the cautious employment of phenothiazine for its treatment in spite of the toxic reactions observed.—T. E. GIBSON.

WHITLOCK, J. H. (1945.) **The administration of phenothiazine and hydrocarbons to sheep.**—*Cornell Vet.* **35.** 328–332. **449**

Although admixture of phenothiazine with the feed may adequately control the internal parasites of sheep, this method alone is not sufficient in most areas. By means of the oesophogeal tube and a 40 or 60 ml. glass-barrelled syringe, W. treated 78 adult sheep in 18 min. with 2-oz. doses of a phenothiazine suspension. Only one fatality was recorded during the treatment of 2,500 sheep. Before tetrachlorethylene was administered by this method, each sheep received 1·5–5·0 ml. of a 10% solution of copper sulphate to stimulate closure of the oesophogeal groove.—G. B. S. H.

*GROULADE, P. (1940.) Traitement de la vaginite granuleuse contagieuse par dilatation gazeuse. **[Treatment of contagious granular vaginitis by dilatation with gas.]**—*Rec. Méd. vét.* **116.** 123–127. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 110.] [See also *V. B.* **9.** 499.] **450**

Of 33 acute cases, 28 (84·84%) and of 180 chronic cases, 149 (82·77%) were cured by this treatment.—J. ZWEIG.

WISE, G. H., & COARSEY, R. W. (1945.) **Measures used in the control of an infectious type of calf scours.**—*Cornell Vet.* **35.** 320–328. **451**

An investigation was made of calf scours occurring over a period of one year in a large

Guernsey herd. The incidence of the disease amongst the calves was about 60% and little improvement resulted, despite meticulous attention to herd hygiene. *Pre-partum* immunization of the dam with autogenous bacterin and subsequent administration of antibacterial serum to the calf reduced the incidence of the disease slightly. Sulphaguanidine treatment of affected calves was very efficacious, about 95% recoveries being noted in 95 cases.—H. Williams Smith.

Guilhon, J. (1941.) Le traitement de la dermatose faciale d'Henry-Lesbouyries par un dérivé du dioxane. **[Treatment of facial dermatitis in dogs with dioxan.]**—*Rec. Méd. vét.* **117.** 289–296. **452**

Symmetric dry dermatitis with alopecia affecting the muzzle and face, observed chiefly in mature dogs of the Groenendal breed, does not always respond to thyroid therapy. On the assumption that a "neuro-hormonal" imbalance was involved, Guilhon & Henry (1938) experimented with benzo-diethylaminomethyl dioxan, a synthetic compound with inhibitory powers on the sympathetic nervous system. The encouraging results obtained induced G. to try dioxan on nine further cases.

Treatment was based on the daily administration of 0·1 g., in the form of pills or, subcutaneously, in 2·5% solution, until the lesions healed, generally after 1–2 months. If dullness, nausea, or vomiting supervened, dosage was reduced or treatment stopped altogether for 24–48 hours. Dioxan (trade mark 883 F., or prosympal) proved efficacious even when other methods of treatment failed.—M. L. Levi.

Melzer. (1944.) Neue Wege in der Behandlung der durch die Verknocherung der Hufknorpel entstehenden Krankheiten. **[The treatment of diseases caused by ossification of the hoof cartilage.]**—*Berl. Münch. tierärztl. Wschr./Wien tierärztl. Mschr.* Sept. 15th. 295–297. **453**

M. explains his theories on the pathogenesis and treatment of foot lameness and true ringbone. He finds that trouble often starts with incorrect levelling of the hoof, the smith leaving the outer quarter too high. This produces uneven stress and pressure on the internal structures of the hoof and causes inflammation, thickening and ossification of the lateral cartilages and the ligaments of the coffin joint. The ossified outer cartilage is pressed laterally on to the coffin joint as a result of the high wall.

In these easily diagnosed cases, he successfully used the following treatment. The hoof was levelled to receive a plain shoe and then a further section of the outer wall was removed, the segment being 0·5 cm. at the heel and tapering towards the toe. The shoe was nailed on to the inner quarter and toe and the horse given gentle exercise on soft ground for three days. As a result, the wall dropped, so that it rested on the shoe and could be nailed all round. The horse was then free from lameness and fit for work. This treatment also succeeded in cases of "hidden" sidebone in association with a distorted and incorrectly prepared hoof. The original should be consulted for further details.—R. A. Roper.

I. Demmel, M. (1943.) Praktische Erfahrungen beim orthopädischen Hufbeschlag. **[Orthopaedic shoeing.]** — *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **51/49.** 184–188. **454**

II. Behn, P. (1943.) Über die Hufrehe. **[Laminitis in horses.]**—*Ibid.* 230–232. **455**

III. Melzer. (1943.) Entgegnung auf die Ausführungen von Regierungsveterinärrat Dr Demmel in Nr.19/20 1943 S. 185 und Dr. Behn in Nr. 23/24 1943 S. 230 der "DTW./TR". **[Comment on the articles of Demmel and of Behn.]**—*Ibid.* 350–351. **456**

I. The principles of treatment are listed for diseases of the foot and lower limbs of horses, which call for attention to the hoof and horseshoe, with particular reference to surgical shoeing.

A heel bar which raises the heels 5 cm. from the ground is advocated as a means of reducing the weight carried and allowing parts which are temporarily inflamed to rest. In most hoof diseases, however, its use is contra-indicated.

Various special shoes are recommended for particular conditions, including a three-quarter ring shoe for a lateral sandcrack and Fritsche's shoe, with a wide flat web, wide incurved bevelled heels and shortened toe, and Werther's H-shaped shoe, a development of Fritsche's, the two side webs being joined across the sole by a supporting bar and the toe completely unsupported, for laminitis, the shoeing for which is discussed in detail.

For acute laminitis energetic treatment is advocated, consisting of surgical shoeing as above, repeated blood letting (6–8–10 litres), stimulative injections thrice daily, walking exercise and cool compresses on the hooves for three days, then followed by a blister applied to the coronets and three days' starvation. This treatment is said to bring about rapid recovery in about eight days.

II. The above treatment, especially the forced exercises, is condemned as cruel.

III. M. answers various criticisms and points out that he repeats blood-letting only exceptionally. He rejects the complaint that the treatment described in I is cruel.—J. E.

MOORE, G. A. (1946.) **Effects of stilbestrol in retained placenta.**—*J. Amer. vet. med. Ass.* **108.** 79–83. **457**

In this work a retained placenta was considered to be one which, in the opinion of an experienced clinician, was too firmly attached to be likely to come away within 48 hours. Treatment consisted of 1–4 doses of 30–80 mg. stilboestrol given intramuscularly. Daily manual examinations of the uterus were made, but there was no attempt to remove the placenta unless it appeared that the life of the animal would be otherwise endangered. The time between calving and injection of stilboestrol varied from 24 to 96 hours. In only eight of the 43 animals was administration of the drug followed by spontaneous removal of the placenta and in four of these animals it was doubtful whether the result was of value. One animal given 80 mg. of stilboestrol died with symptoms like those of parturient paresis and in four others there were violent straining and severe vaginitis. M. points out that reports of the successful use of stilboestrol are often based on the treatment of cows which were not examined before dosage and in which removal of the placenta would probably have occurred without it.—E. G. WHITE.

GREEN, F. H. K. (1945.) **The local treatment of thermal burns.**—*Bull. War Med.* **5.** 605–613. **458**

In this critical review of present-day treatment of burns the most important features are the following.

All procedures, from first-aid onwards, should be carried out as aseptically as possible. Burns should be covered quickly to keep out air and infection and dressings should be firm: in the U.S.A., pressure bandages have been used with success.

For local application a bland cream incorporating an antibacterial agent such as a sulphonamide or penicillin, or "cetavlon" [cetyltrimethyl-ammonium bromide] may be used liberally underneath the bandages. Such dressings may be left on 7–14 days. In hospital, "cetavlon" is a useful agent for cleaning burns and surgical treatment should aim at removing all debris. Skin grafts should be made as soon as the wound is healthy enough. Where sulphonamides fail to control infection, propamidine or penicillin should be tried. Chlorine disinfectants are useful against Gram-negative organisms. Tissue poisons and coagulants are contra-indicated as they tend to form a film under which sepsis, which will remain unaffected by further application of dressings, may occur unnoticed.—R. A. ROPER.

*GUALTIEROTTI, T., MARTINI, E., & MARZORATI, A. (1942.) Untersuchungen über die Elektronarkose. Mit besonderer Berücksichtigung der aktiven elektrischen Erscheinungen des zentralen Nervensystems. [**Electronarcosis.**]—*Pflüg. Arch. ges. Physiol.* **246.** 359–371. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 245–246.] **459**

By allowing a one-way current to pass through the di-mesencephalon for 30 sec., an electronarcosis was produced in animals and human subjects, which lasted for 20 min. (but in one case five hours) and started with a tonic cramp. When the motor centres of the cortex were affected, chronic convulsions occurred. The narcosis was accompanied by complete anaesthesia and hypotonia and in a few cases by hypertonia. Drowsiness remained for some time on termination of the narcosis. The action potentials of the cerebellum and medulla decreased during the narcosis and in some cases disappeared completely. The authors conclude that the effect was produced by an active inhibition originating in a di-mesencephalic centre. The active potentials of the cortex increased in the slow, but decreased in the quick rhythms. Large slow changes of potentials were observed in the medulla when the narcosis was discontinued. This finding could not be explained.—E. KODICEK.

I. BERGMAN, H. C., & PRINZMETAL, M. (1946.) **The antishock action of ethanol in burned mice. Effect on edema formation and capillary atony.**—*J. Lab. clin. Med.* **31.** 654–662. **460**

II. BERGMAN, H. C., & PRINZMETAL, M. (1946.) **The antishock action of certain drugs in burned mice.**—*Ibid.* 663–671. **461**

[Authors' summaries copied *verbatim.*]

I. Intraperitoneal injection of ethanol increases survival time and diminishes mortality in mice subjected to a standardized thermal injury. This agent has a prophylactic effect when administered before the burn but is without antishock action when given after the trauma.

In burn shock, the circulating blood volume as represented by the bleeding volume is significantly reduced, and the prophylactic administration of ethanol curtails the expected reduction. Ethanol counteracts shock (1) by diminishing local fluid loss (edema formation) and (2) by reducing visceral congestion due to capillary atony.

II. Sodium pentobarbital, morphine, histamine, acetone, glycerol, and propylene glycol display antishock activity similar to that of ethanol. These substances increase survival time and diminish mortality in mice subjected to a standardized thermal injury.

The mechanism whereby morphine, pentobarbital, and histamine counteract shock was

investigated by observing the effect upon two major factors implicated in burn shock, namely, local fluid loss and capillary atony.

Each of these drugs curtails edema formation at the site of the burn, but only if injected before the trauma. They neither prevent the development of edema nor accelerate the absorption of fluid when given after the burn. Morphine in addition counteracts visceral congestion due to capillary atony.

BERRY, H. (1945.) **Scientific principles in the design and choice of ointment bases.**—*Brit. med. Bull.* **3.** 182–185. **462**

B. discusses the use of ointment bases and their relative efficacy in the treatment of wounds and disorders of the skin. An ointment base should be capable of rapid absorption and metabolism after absorption, such as lard, glycerin and soap, and should be bland, neutral and non-reactive like paraffin. The ability to carry medicaments through the skin is an additional valuable property found in soaps and emulsions. B. reviews recent literature on modern ointment bases, including oil in water and water in oil emulsion creams, mucilaginous bases and tri-ethanolamine soaps.—J. P. BUXTON.

TILLEY, F. W. (1946.) **The influence of changes in concentration of sodium hydroxide upon its bactericidal activity.**—*J. Bact.* **51.** 779–785. [Author's summary copied *verbatim.*] **463**

The bactericidal efficiency of sodium hydroxide against *Staphylococcus aureus* and *Escherichia coli* was determined by a modified Rideal-Walker technique. From the resulting experimental data, values for the concentration exponent n were calculated by the formula, $n = \frac{\log t_2 - \log t_1}{\log c_1 - \log c_2}$ for results presented in tabular form, and by the formula $n = \frac{y_2 - y_1}{x_1 - x_2}$ for results presented in graphical form.

When test cultures were grown in ordinary beef infusion broth, the values obtained for n were approximately 1·6 for *Staphylococcus aureus* and 5·6 for *Escherichia coli.*

Within a comparatively limited range of concentrations the bactericidal action of sodium hydroxide against both test organisms followed, with either small or large amounts of organic matter, an approximately logarithmic course. However, the slope of the curve was related to the organic matter present. Bactericidal efficiency was correlated with the final pH of the test mixtures. When the pH fell below 10, efficiency suddenly dropped, and at a pH between 10 and 9 disappeared altogether.

See also absts. **266** (treatment of mastitis), **398** (of corneal ulcers), **360**, **361** (anthelmintics), **410** (sulphonamides), **510** (pharmacy), **343** (virus inactivation by " free " chlorine).

HYGIENE, PUBLIC HEALTH AND VETERINARY SERVICES

HOPSON, G. H., LINDSEY, K. J., & BRADDOCK, T. (1945.) **Why milk sanitarians are interested in better milking.**—*J. Milk Technol.* **8.** 205–216. **464**

The authors think that machine milking should be systematized like a factory process, maintaining that by this method the greatest number of cows is milked in the shortest time, while udder health and maximum production of milk and fat are maintained. The proper milking of cows increases the milk yield by 10%.

Regularity of milking and hygiene are stressed and most important advice on training heifers for their first milking is given. Heifers should not be allowed to suckle the calf nor should they be hand milked, the machine should be used from the beginning. The colostrum will not adhere to the milk surfaces of the milker if it is promptly rinsed.

Special points are made of the transfer pail, teat cup sanitation, udder sanitation, the " problem cow ", which always requires special attention, milk in the air lines and the proper care and management of the machine which is so important to udder health and to quality milk.

The article is illustrated by fourteen clear and excellent photographs, showing many of the methods advocated.—D. S. RABAGLIATI.

BENDIXEN, H. A., & SMITH, L. J. (1945.) **Approved milking parlors for the State of Washington.**—*Bull. Wash. agric. Exp. Sta.* No. 461. pp. 39. **465**

A " milking parlour " is defined as a relatively small, well lighted room where cows, one batch at a time, are held only during milking. This bulletin consists largely of a description of their construction and deals in great detail with the foundations, building materials, lighting, ventilation, electric wiring and so on.

The buildings recommended consist of accommodation for 4–16 stalls in single or double rows, depending upon the size of the herd. A special feature of some of the plans suggested is the provision of a foot bath where the cows enter. The advantages and disadvantages of the system are tabled, the former easily outweighing the latter. The bulletin gives full-page plans of alternative layouts, photographs and constructional diagrams.—D. S. RABAGLIATI.

THOMAS, B. F. (1944.) **The incidence of Mycobacterium tuberculosis and Brucella abortus in milk from mid and west Wales.**—*Proc. Soc. agric. Bact., 1944.* pp. 48–52. **466**

Representative herd bulk milk samples from farms in certain Welsh counties were examined for *M. tuberculosis* and *Br. abortus* by the inoculation of g. pigs with the sediment and cream layers. The proportion of tuberculous samples in 1,275 samples of undesignated milk was only 0·78%; the low incidence is attributed to the absence of flying herds in the area. In the accredited group (461 samples), 0·43% were positive; none were affected in a small number (26) of samples from tuberculin-tested herds. In raw milk delivered to schools there were 1·01% positive results, while all the pasteurized samples were negative.

The existence of *Br. abortus* was determined from spleen lesions in g. pigs at the 6th–8th week and by culturing this organ. Milk from tuberculin-tested herds was the least satisfactory, with 15·38% positive results as compared with 12·36% in accredited herds and 6·98% in undesignated samples. In some instances the agglutination test was applied to the whey and to the heart blood samples from the g. pigs. A total agreement of 76% was obtained, the discrepancy arising from 12 samples in which the whey test was positive but the blood test was negative.—R. E. GLOVER.

*ANDERSEN, A. C., & VESTESEN, H. Om Fosfataseprøvens Anvendelighed ved Kontrol med Pasteuriseringbestemmelsernes Overholdelse. [**Use of the phosphatase test for pasteurized milk.**]—*Beretn. Forsøgslab., Kbh.* No. 210. [Kr. 0·75.] [Abst. from abst. in *Maanedsskr. Dyrlaeger.* **56.** 295–296.] **467**

The report is in three parts. In the first, on the control of pasteurization of milk and dairy produce, ANDERSEN reviews the development of pasteurization regulations in Denmark and Sweden and the principles underlying the various tests. In the second part, on a method for the determination of phosphatase in milk, VESTESEN describes his modification of the method of Aschaffenburg and Neave, which itself is a modification of Scharer's quick method. The technique has the advantage that it can be used on milk preserved several days. In the third section, on the use of Vestesen's method, ANDERSEN reports successful results obtained. Raw milk added to pasteurized could be detected in quantities down to 0·1%, or less when its phosphatase content was high. The method gives good results with milk samples preserved with potassium dichromate; the addition of sodium benzoate, however, seems to influence the result after a few days. The test takes too long to be used for all samples: Scharer's quick method should be used first and any doubtful samples retested by Vestesen's.—M. E. R.

NICHOLLS, L., & NIMALASURIYA, A. (1939.) **The preparation of fermented milk ("curds").**—*Ceylon J. Sci.* Sect. D. **5.** 17–20. **468**

In communities living under primitive sanitary conditions milk is often fermented before it is consumed. Examples are the "yoghurt" of Bulgaria and Turkey, "matzoon" in Armenia, "leben" in Egypt, "koumiss" in Russia, etc.

In Ceylon fermented milk, known locally as "curds", is made usually from buffalo's milk, which has been boiled and cooled and to which a small piece of "curd" from a previous preparation has been added as a "starter". A firm curd forms which is eaten after a period of from 1½–3 days.

The organisms present include some yeasts, *Streptococcus lactis* and a Gram-negative lactobacillus. In most samples the *Str. lactis* and the yeasts predominate. Acidity increases rapidly during fermentation. N. tested the bactericidal properties of milk which had been fermented for 24 hours, using *Salmonella typhi* and *Bacterium flexneri* as test organisms. These organisms were killed in acid whey from fermented milk within three hours.

The authors consider that in primitive communities, especially in hot climates, the use of fermented milk should be encouraged. Pathogenic organisms are destroyed by the high acidity and the yeasts and other organisms increase the vitamin content especially of the vitamin B complex.—M. C.

LORENZEN, H., & SKIBSTED, S. (1945.) Slagterikredsvis Sygdomsbekaempelse. [**Control of disease in areas served by abattoirs.**]—*Maanedsskr. Dyrlaeger.* **57.** 131–146. **469**

When a case of bovine TB. is detected by the veterinarian in charge of an abattoir, the following procedure is adopted. The animal is identified, the name, address and dairy number of the owner are obtained and specimens are sent to the laboratory for type determination. At the same time the local veterinarian is notified and both he and the owner are informed of the result of the laboratory tests.

The case is described of bovine type TB. diagnosed at an abattoir in pigs slaughtered from a particular herd. Tuberculin tests on the cattle at the farm proved negative but infection was traced to the farmer, who was found to have TB. of the kidneys and from whose urine bovine type bacilli were isolated.

The article also discusses the systematic control of TB. in poultry, and a plan prepared by the Veterinary Directorate is quoted in full. The

control of disease is one of the duties of the Meat Inspection Service.—R. PETER JONES.

*WAGNER, A. (1945.) "Les nouveaux abattoirs de Lausanne." **[The new abattoir at Lausanne.]** — Lausanne : Imprimerie vaudoise. [Abst. from review in *Schweiz. Arch. Tierheilk.* **87.** 383–384.] **470**

W. describes the general layout and modern equipment of the new abattoir at Malley-Lausanne, Switzerland.—G. HUEHNS.

*MARTEL. (1943.) Sur les viandes susceptibles d'être récupérées. **[Utilization of unsound meat.]**—*Bull. Acad. Méd. Paris.* **127.** 26–30. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 139.] **471**

Meat from under-nourished carcasses, still-born calves or animals affected with dropsy can be made consumable in the same way as that from animals affected with TB. or cysticercus. The fat should be extracted under veterinary control. When there is suspicion of danger meat should be bacteriologically examined. Sterilization by steam under pressure must be carried out under strict supervision.—J. ZWEIG.

*MARTINI, I. (1942.) Alcune attuali conoscenze sulla eziopatogenesi dei cosidetti avvelenamenti da carne e le illazioni che ne conseguono. **[Meat poisoning.]**—*Clin. vet., Milano.* **65.** 306–320. [Abst. from abst. in *Jber. Vet.-Med.* **71.** 142.] **472**

The aetiology and pathogenesis of meat poisoning and its prevention are reviewed.—J. Z.

MURPHY, W. A., & EDWARD, D. G. ff. (1944.) **An outbreak of food poisoning caused by staphylococcal enterotoxin.**—*Mon. Bull. emerg. publ. Hlth. Lab. Serv., Lond.* **3.** 100–103. **473**

An outbreak of food poisoning associated with a 6 lb. tin of pork luncheon meat was investigated. All of the nine persons who had consumed the meat were affected two hours later with vomiting, diarrhoea and varying degrees of abdominal pain. The only abnormality observed in the meat was its paste-like consistency. No organisms were observed microscopically in stained films made from the interior or exterior of the meat. Plate counts on yeastrel agar showed 800 colonies per gramme from the surface of the meat and 900 colonies per gramme from the interior of a pure growth of coagulase-positive *Staphylococcus aureus.* An unopened tin from the same batch gave sterile cultures. Swabs from the hands, throat and nasal cavities of the two shop assistants in contact with the meat revealed one to be a profuse nasal carrier of *Staph. aureus* Type Ia. The other had a few *Staph. aureus* organisms on her hands, but this strain proved inagglutinable. The staphylococcus isolated from the meat was Type IIIc. Although the origin of the contamination is obscure it is suggested that the evidence points to the staphylococcus having been present in the meat before the tin was opened.—S. JAMIESON.

KELLEY, D. C., & BYRNE, R. J. (1946.) **Processing Del-Mar-Va poultry for the armed forces.** —*Bull. U.S. Army med. Dep.* **5.** 95–99. **474**

This article describes the rapid means of killing and dressing poultry used in the United States Army. Del-Mar-Va is a body of land embracing the state of Delaware and parts of Maryland and Virginia and the name is now linked with the "broiler industry" for poultry. This area is very suitable for poultry rearing and the most popular breed is a cross between the Barred Rock and the New Hampshire.

The chickens are taken from the farms to batteries in the factories at about 14 weeks of age and are fed on dried pellets for three days to regain lost weight; for the last six hours before slaughter they are fed on moist mash, so that the crops may be more easily emptied after slaughter. The note describes how up to 4,000 birds can be killed mechanically in an hour, by severing the blood vessels on the ventral surface of the neck. The carcasses are steamed and dipped in hot wax in order to assist in plucking; after mechanical plucking, aided by hand, they are placed in layers of ice and water to bring the temperature to 40°F. They are then allowed to drain and are graded and packed. Experiments carried out to determine what given increase in weight of the dressed birds was brought about by the initial cooling to 40°F. indicated that this could reach 3·77% or even more.—D. S. RABAGLIATI.

SIEVERS, J. J. (1946.) **The relation of animal diseases to public health.**—*J. Amer. vet. med. Ass.* **109.** 117–120. **475**

This general survey points out that public interest is not confined only to those diseases which are intercommunicable and cause death or illness to human beings, but is also concerned with diseases which may lead to an increase in the cost of animal products.

The virtual elimination of bovine TB. in the U.S.A. makes it possible to study methods for the control of brucellosis and undulant fever. In January, 1941, every one of the 3,071 counties in the U.S.A. had been accredited or was designated free of TB. Rabies is still a serious problem in the U.S.A. and although infection by ingestion is unlikely, it is advised that all milk be pasteurized or boiled before use, as the disease occasionally occurs in cattle. Anthrax still occurs; in the state of Illinois alone, during the last 25 years, there was an average of 1·6 human beings affected a year. Other diseases mentioned are equine

encephalomyelitis, actinomycosis, mastitis, tetanus and parasitic diseases such as trichinosis and tapeworm infestation. The article ends with a reference to the value of animals for the production of such substances as insulin.—D. S. RABAGLIATI.

ANON. (1945.) **The importation of pets.**—*Bull. U.S. Army med. Dep.* **4.** 420–421. **476**

This is a short article reminding personnel of the military restrictions on the transport of pets and mascots, on army conveyances and transport allocated to the U.S. War Department. A summary of the civil restrictions is also given.

Dogs intended for the care of livestock may be detained until laboratory examination has ruled out the presence of sheep tapeworm, but otherwise there are no civil restrictions on the importation of dogs into the United States except in the territory of Hawaii, where there is a quarantine period of 120 days for animals liable to rabies. —R. R. A. COOMBS.

HARBITZ, F. (1945.) Trekk av den medisinske vitenskaps utvikling i de siste 50 år (med saerlig henblikk pa Norge). [**Development of medical science in the last 50 years, with special references to Norway.**]—*Norsk VetTidsskr.* **57.** 81–102. **477**

In a review of the development of medical science in Norway, H. mentions the foundation in 1891 of the Veterinary Laboratory and in 1914 of the Veterinary Institute, and their subsequent importance in the control of bovine TB. and contagious abortion.—R. PETER JONES.

See also absts. **272** (milk transmission of vibrionic gastroenteritis), **273** (TB. in meat), **319** (leptospira transmitted by dogs), **294** (rats and food poisoning).

TECHNIQUE AND APPARATUS

*BACHL, A. (1941.) Beitrag zur elektiven Züchtung des Streptococcus agalactiae. [**Cultivation of** *Str. agalactiae.*]—*Inaug. Diss., Vienna.* [Abst. from abst. in *Zbl. Bakt. I.* (*Ref.*). **144.** 17.] **478**

A medium consisting of 0·2% glucose, 0·2% lithium chloride, 0·01% sodium azide and 0·000067% crystal violet was not suitable for the growth of *Streptococcus agalactiae*, but inhibited grossly contaminating organisms and other micrococci to a certain extent.—J. ZWEIG.

PEPPLER, H. J. (1942.) **A bacteriological comparison between synthetic and natural glycerol.** —*J. Bact.* **44.** 233–236. **479**

The cultivation of *Salmonella pullorum* in synthetic glycerol medium had no deleterious effect on the virulence of the bacteria ; the growth was as good as when the glycerol used was that prepared from animal fats.—A. BUXTON.

ELBERG, S., EDWARDS, E. P., & SWANSON, R. W. (1946.) **A selective medium for the isolation of** *Brucella suis.*—*Amer. J. publ. Hlth.* **36.** 650–652. [Authors' summary copied *verbatim.*] **480**

A medium composed of Difco Tryptose agar to which tyrothricin and sodium azide were added has proved suitable for the direct isolation of *Br. suis* from the feces of experimentally infected animals.

It was suggested that this medium may assist in further studies of the pathogenesis and epidemiology of Brucellosis.

NAGLER, F. P. O. (1945.) **A cultural reaction for the early diagnosis of** *Clostridium oedematiens* **infection.**—*Aust. J. exp. Biol. med. Sci.* **23.** 59–62. **481**

Details are given of a special medium on which *Cl. oedematiens* will develop characteristic colonies. It contains V.F. agar [see *V. B.* **16.** 328, abst. 1897], egg yolk and defibrinated sheep blood. After 16 hours' incubation the colonies are irregular in shape, surrounded by an opaque haemolytic zone inside a circular dark red zone. The diagnostic feature is that the colonies are covered by an opaque film with a pearl-like lustre. No other anaerobic organism tested produced both the pearly film and the dark red zone.—N. W.

JOHNSON, E. A. (1946.) **An improved slide culture technique for the study and identification of pathogenic fungi.**—*J. Bact.* **51.** 689–694. [Author's summary copied *verbatim.*] **482**

An improved slide culture technique is described for the study and identification of *pathogenic fungi*, in which special provision is made for excluding contaminants. It is relatively easy to prepare.

A new specially devised potato glucose agar is recommended for use with this slide culture for stimulating early and abundant sporulation, in order that the recognition of particular varieties of fungi may be facilitated for the technician and for the student.

A technique is described for making permanent stained mounts from these slide cultures that preserve intact the morphological features of the fungus. These slides are especially useful for teaching purposes and are valuable for making photomicrographs.

DE BEER, E. J., & SHERWOOD, M. B. (1945.) **The paper-disc agar-plate method for the assay of antibiotic substances.**—*J. Bact.* **50.** 459–467. [Authors' summary copied *verbatim.*] **483**

A simplified modification of the Oxford plate method for the assay of antibiotic substances has been described. A study has been made of the

effects of the following factors upon the precision of the assay: (a) method of measuring dose volumes, (b) depth of agar, and (c) number of test organisms per plate. The log dose-response curve was found to be linear.

LAMANNA, C. (1946.) **The nature of the acid-fast stain.**—*J. Bact.* **52.** 99–103. [Author's summary copied *verbatim.*] **484**

The beading of cells when stained with Ziehl-Neelsen's carbol-fuchsin is postulated to be the result of phenol and dye separating out as a liquid phase. Evidence for this point of view is presented. It can be considered that the basis for the acid-fast property lies in the greater solubility of the phenol and dye in the cell constituents than in the decolorizing agent.

LILLIE, R. D. (1946.) **Effect of metals on Giemsa stain solutions in fifty per cent glycerol and methanol mixture.**—*J. Lab. clin. Med.* **31.** 253–256. [Author's conclusions copied *verbatim.*]**485**

Various metals have the property of decomposing thiazine eosinates in glycerol methanol solution and removing the eosin from those solutions. These are relatively active metals in the electrolytic series. However, alkali earth metals appear to act purely as alkalies.

Zinc acts on methyl thionins in glycerol methanol solution, but not on thionin, to shift their spectral absorption bands toward the red end of the visual spectrum.

The use of tin foil or other foils containing tin, zinc, or cadmium for lining screw caps for Giemsa stain is contraindicated. Copper foils containing appreciable admixtures of zinc or tin seem to be similarly contraindicated. Paraffined cardboard seems to be the most innocuous and generally satisfactory lining material for such caps.

HIGGINS, A. E. H. (1945.) **The design and use of sprayers for insect control.**—*Brit. med. Bull.* **3.** 229–232. **486**

A description is given of types of nozzles and sprayers for use with insecticides. Most of the spraying apparatus available has been designed for agricultural spraying, paint spraying or light household use and is wasteful of valuable insecticides. Further, in the design of atomizing nozzles little attention has been given to the effect of particle size upon toxicity. Experience has shown that it is better to design apparatus based on careful biological testing and sound engineering design than to attempt to adapt or improve existing proprietary equipment.—W. MOORE.

EVANS, G. O. (1946.) **A method for observing the life-cycle of** *Melophagus ovinus* **(Linn.) [Correspondence.]** — *Nature, Lond.* **157.** 773. **487**

E. confined sheep keds to a given area of shorn sheep skin by attaching thereto a cotton "sleeve" in plain knitting. A mixture of 80% resin and 20% beeswax attached this to the skin and the outer end was closed by a zip fastener. This arrangement satisfactorily confined keds for periods up to eight weeks.—G. B. S. HEATH.

LICHTMAN, A. L., & MCDONALD, J. R. (1946.) **Birefringence in tissues.**—*Arch. Path.* **42.** 69–80. [Authors' summary copied *verbatim.*] **488**

Benefits are to be gained by the use of the polarizing microscope in pathology. Polarized light permits visualization of lipid aggregates, crystals and subcellular structures not visible in ordinary light. The anisotropism, or the orientation that produces birefringence in tissues that support, move or protect organisms or conduct nervous impulses, is fundamental in the organization and function of such tissues. In the development of tissues the anisotropic substances or oriented molecules tend to induce mutual adlineation in similar substances adjacent to them.

CLAUDE, A., & FULLAM, E. F. (1946.) **The preparation of sections of guinea pig liver for electron microscopy.**—*J. exp. Med.* **83.** 499–504. [Authors' summary copied *verbatim.*] **489**

A method is described whereby sections of guinea pig liver cells can be prepared for electron microscopy after fixation. The high resolving power of the electron microscope reveals the presence of two components, one particulate, the other apparently of fibrous texture, in the ground substance of the cells.

ALDERTON, G., WARD, W. H., & FEVOLD, H. L. (1945.) **Isolation of lysozyme from egg white.**—*J. biol. Chem.* **157.** 43–58. **490**

Details are given of a method for the isolation of lysozyme from egg white by the adsorption of the lysozyme on bentonite [a clay consisting mainly of silica and alumina], elution of contaminating protein from the clay by successive extractions with 5% aqueous pyridine adjusted to pH 7–8 by a suitable phosphate buffer, and final elution of the active material with 5% aqueous pyridine adjusted to pH 5·0 by sulphuric acid. After dialysis of the eluate the material is dried in the frozen state. The resulting white fluffy powder contains 85–90% of the lysozyme originally present in the egg white. Such preparations were shown to be essentially pure by fractionation with sulphate of ammonia, by electrophoretic and sedimentation studies and by their behaviour towards enzymes.

Lysozyme appears to be a basic protein, with isoelectric point at pH 10·5–11·0 and molecular weight of about 17,000. It is stable in acid solutions and relatively stable in alkaline solutions, no loss of activity occurring over a period of 5–6 hours

at pH 11·5. It has also been prepared in crystalline form, crystallization being effected around the isoelectric point at pH 10·8, at neutrality and in acid solutions pH 3·5–5·0, though the crystal form appears to vary depending on the pH of crystallization and the acid used to dissolve the protein. The identity of lysozyme with a specially prepared globulin (LONGSWORTH *et al.*, 1940), appears to be established.—A. EDEN.

PHILLIPS, P. H. (1945.) **A practical method of coloring semen for identification purposes.**—*J. Dairy Sci.* **28.** 843–844. **491**

Experiments were conducted with a series of dyes which were used to colour semen for identification of samples to avoid mistakes at insemination centres. The resulting mixtures of semen, dye and egg-yolk buffer solution were stored at 5°C. and tested for motility every 24 hours for up to six days. Nile blue sulphate, neutral red, and sudan III were all satisfactory in that they had little or no effect upon the spermatozoa, although sudan III, being a fat-soluble dye, did not colour the semen to any great extent. Janus green is satisfactory for up to 72 hours after which the colour fades, but methylene blue, thionin, and alizarin sulphate proved to be unsatisfactory. —R. F. G. SANDERCOCK.

SCHÖNBERG, F. (1943.) Die Hämoglobin-Pseudoperoxydase-Probe mit Guajaktinktur als Hilfsmittel zur Feststellung des Ausblutungsgrades im Fleisch der Schlachttiere. [**The haemoglobin-pseudoperoxidase-test with tincture of guaiacum for grading the degree of bleeding of carcasses.**]—*Z. Fleisch- u. Milchhyg.* **53.** 194–196. **492**

The degree to which carcasses have been bled is assessed by the haemoglobin-pseudoperoxidase test. If the animal has not been completely bled fresh fragments of muscle, if covered with tincture of guaiacum, develop a blue coloration on the addition of hydrogen peroxide. A constant quantity of peroxide (two drops of a 2% solution perhydrol) is added and the intensity and velocity of the reaction depend mainly upon the blood content. The enzyme peroxidase is present in small amounts and a reaction to the guaiacum test is due mainly to the pseudoperoxidase action of the haemoglobin iron.—E. F. MCCARTHY.

GODFREY, G. S., BUSS, R., & WINTER, A. R. (1945.) **Formalin fumigation of hatchers by the cheesecloth method.**—*Poult. Sci.* **24.** 417–422. **493**

The authors compared the bacterial count of the air in separate hatchers and in incubator hatchers. They found that during incubation the number of bacteria per cu. ft. of air was greater in the machines with a separate hatching compartment than it was in machines with combined incubating and hatching compartments.

The use of 15 ml. formalin per 100 cu. ft. of air space for fumigating incubators by the cheesecloth method was found sufficient for the destruction of *Salmonella pullorum*.—A. BUXTON.

SHORT, G. V. (1946.) **The use of electrical appliances in shrapnel detection.**—*J. R. Army vet. Cps.* **17.** 106–107. **494**

S. describes a method of detecting foreign bodies embedded deeply in various situations in the body. The instrument eventually found to be most practical was the Polish mine detector, model 4, which is battery-activated and consists of coils and a rectifier, amplifying stages and earphones. Being independent of a mains supply of electricity, it is also portable.—A. H. HOGG.

HUTCHINGS, R. C. (1945.) **Difficult fracture reduction with the aid of the Stader splint.**—*N. Amer. Vet.* **26.** 672–673. **495**

An account is given of the use of the Stader splint in the treatment of an intratrochanteric fracture of the femur of a four-month-old kitten. Open reduction under nembutal anaesthesia was employed, an ordinary wire being inserted through the trochanter major and bent to fit into the pin bar of the splint. The lower pins were inserted into the shaft of the femur. The splint was worn without trouble for four weeks and union occurred without complication.—D. D. OGILVIE.

TOBIAS, J. M., & WESTON, R. E. (1946.) **An apparatus for measuring the retained dose of inhaled substances.**—*J. Lab. clin. Med.* **31.** 806–814. [Authors' conclusions copied *verbatim*.] **496**

An apparatus has been constructed which permits accurate measurement of the actual doses of certain inhaled substances retained by unanesthetized animals. The percentage of inhaled material retained may be calculated readily. There is very little resistance to normal respiratory air flows. The essential parts of the apparatus are entirely of glass and easily obtainable.

REGAN, J. M., & HENDERSON, M. S. (1944.) **Charcoal wool filter cloth as a deodorant.**—*Proc. Mayo Clin.* **19.** 268–270. **497**

The authors describe a lightweight woollen material impregnated with activated charcoal dust which controls the odour from wounds treated by the closed plaster cast method. The material is effective for 2–5 weeks and can be reactivated by steam sterilization and washing in a weak solution of ammonia. It is especially useful in the form of a sock covering an extremity.—S. M. G.

See also absts. **316** (diagnostic test for malaria), **379** (surgery of ruptured diaphragm), **453–456** (orthopaedic shoeing).

MISCELLANEOUS

JENSEN, H. (1944.) Dyrlaegernes Attestskrivning. **[Veterinary certificate writing.]**—*Maanedsskr. Dyrlaeger.* **56.** 317–339. **498**

J. discusses the many kinds of certificate required in the course of veterinary practice, giving instructions on lay-out and basic principles. He describes, with drafts, certificates for such things as P.M. diagnosis, general health and soundness (including export and import certificates), warranty cases involving declaration of soundness or finding of disease in animals sold as sound, and age attestations. Finally a list is given of redhibitory periods in connexion with specified diseases in farm animals.—J. E.

SEIFERLE, E. (1943.) Zur Psychologie des Pferdes. **[The psychology of the horse.]**—*Festschr. Prof. Dr. Oskar Brügi.* pp. 318-345. [Abst. from abst. in *Schweiz. Arch. Tierheilk.* **87.** 110–111.] **499**

After an introductory discussion of the mind in man and animals, S. deals with the behaviour of the wild horse and the modifications which have occurred in the course of domestication. Different individuals react differently to the same set of environmental factors and certain cases of vice in the horse need to be viewed in the light of the conflict occurring between the mind of the animal and that of its master. It is suggested that vice in the horse should be classified as associated with instinct, conditioned by pain or disease, or due to maladjustment of the horse-human relationship. —E. G. WHITE.

*KAHNERT. (1943.) Der Versicherungsschutz für Nutz-, Zucht- und Schlachttiere, Schadenursachen und Schadenverhütung. **[Insurance of fattening, breeding and slaughter animals.]** Berlin: Deutschen Bauerndienst Tierversicherungsgesellschaft. [Abst. from review in *Dtsch. tierärztl. Wschr./Tierärztl. Rdsch.* **52/50.** 95.] **500**

In this work, written by the director of an animal insurance company, extracts from all the laws concerning animal insurance are given, with notes. Animals can be insured for life or for short periods, such as pregnancies, or while being transported or pastured; various forms of insurance are also applicable to fattening, breeding and slaughter animals. The relation of the veterinary surgeon to animal insurance is discussed and statistics are given relating to animal epidemics and their prevention. These statistics denote the losses in different species from various diseases and are of special value for their information about the age groups affected. K. makes a number of useful comparisons with insurance systems in other countries.—G. HUEHNS.

*COTTAM, C. (1944.) **Starlings feeding on the backs of cattle.**—*Migrant.* **15.** No. 2. 24–25. [Abst. from abst. in *Biol. Abstr.* Sect. F. **19.** No. 5. 36.] **501**

Starlings may feed on ox warbles, sheep "ticks" [*Melophagus*], etc., and sometimes acquire a taste for flesh. Cattle, once attacked, may stampede at the presence of a starling flock.

REPORTS

GREAT BRITAIN. (Undated.) **Report for the three years, 1941, 1942, 1943 of the National Institute for Research In Dairying, University of Reading.** [KAY, H. D.] pp. 76. Reading: National Institute for Research in Dairying. 4to. **502**

The report gives a list of the Directors and staff of the Institute and is divided into two sections, the first dealing with general matters and the second comprising reports of the Dairy Husbandry, Chemistry, Bacteriology, Dairy Bacteriology and Advisory Service, and Physiology and Biochemistry Departments.

In 1943 the Society of Dairy Technology was founded, its growth and activities being indicative of the trend towards co-operation in solving dairy problems. Problems intensified by the war received most study. In particular, the war accentuated the need for a more durable cow, one with an average of 6–7 lactations as opposed to the usual 3½.

On September 30th, 1940, the staff of the artificial insemination centre consisted of a veterinary officer in charge, with a part-time veterinary assistant and a laboratory assistant. Seven bulls, namely three Shorthorn, two Friesian and two Guernseys, were in use and 120 herds with about 1,800 cows were enrolled. The correct feeding, management and handling of bulls under these conditions has yet to be ascertained.

An attempt was made to determine the effect of air raids on the composition of milk; following air raid shock there was a marked temporary reduction in yield but there was no evidence of any effect on the fat or solids-not-fat of the milk. MASTITIS, pasteurization, the effect of iodinated protein on the milk yield, the physiology of lactation and reproduction and many other problems were also studied.

The report ends with a list of papers published during 1940–43.—D. S. RABAGLIATI.

EIRE. (1946.) **Annual Report of the Medical Research Council of Ireland 1945.** pp. 19. Dublin: Medical Research Council. Items of veterinary interest pp. 7, 8, 9, 13 & 16. Fcp. Mimeographed. **503**

The work of the Council in 1945 is briefly reviewed. Items of special veterinary interest include the award of two out of three studentships to veterinary surgeons, and a grant-in-aid to Prof. KEARNEY for an investigation of the incidence of bovine TB. in human beings. RONAN-FANNING & HARNETT attempted to repeat the experiments recorded by LIGHT & HODES [*V. B.* **16.** 77] in America on a virus gastro-enteritis of children transmissible to calves. In three experiments filtrates of faeces from children with gastro-enteritis were administered intranasally to calves. The results were inconclusive and did not confirm the claims of Light & Hodes.—M. C.

BOOK REVIEWS

ENGELER, W. [Dipl. Ing. agr., Dr. sc. techn.] (1943.) Die Haltung der Zuchtstiere. [**The maintenance of breeding animals.**]—*Landw. Jb. Schweiz.* **57.** No. 6. 522–630. 20 graphs, 48 tables & 420 photographs. Berne: Druck und Verlag Verbandsdruckerei AG. 8vo. **504**

This book is devoted to a study of the methods of cattle breeding in Switzerland, being based on the records of the co-operative breeding societies for the Brown Swiss breed which comprises about 42·5% of the cattle population.

Considerable statistical information is given as to the number of pedigree bulls maintained in the various cantons and their ratio to the female cattle population, the best age for the purchase of bulls, the age at which they are first used for service and the age at which they are discarded, the influence of intensity of service on fertility and on the period of utility; it is noted that the intensity is negatively correlated with fertility and varies from an average of five services a month in some areas to as many as 120 a month in Graubünden, where there are only 1·5 pedigree bulls per 100 females and a short breeding season is imposed by climatic conditions.

Exhaustive information is given about the financial arrangements made by the co-operative societies, the method of distributing bulls to shareholders and the regulations covering their maintenance, the methods of insurance and the safeguards adopted against the development and spread of venereal diseases. Artificial insemination is of value in avoiding disease, but does not increase the utility of sires. The book is copiously illustrated with photographs of the Brown Swiss cattle set in the beautiful scenery of Switzerland.
—U. F. RICHARDSON.

ANON. (1945.) **A food plan for India.** pp. xvi + 62. London, New York & Bombay: Humphrey Milford, Oxford University Press. 8vo. 3s. 6d. **505**

This booklet presents a food plan for India which originated as the result of investigations and discussions following the report of Professor A. V. HILL who visited India from November, 1943, to April, 1944. There is a preface by Lord ASTOR, chairman of the Institute of International Affairs. The book deals mainly with the improvement in the production of food grains, the quality of food levels and the distribution of food for human nutrition.

The plan includes the improvement of milk supplies and animal products. The wider adoption of methods of artificial insemination is recommended to accelerate improvement of cattle, and for road transport the provision of pneumatic-tyred wheels for the bullock cart.

The cattle population in India is 200 million head, but the quality of these cattle is very low, especially in areas of heavy rainfall with poor soil. BURNS (1944) gave statistics for livestock population and milk produced in various parts of India. In three regions where the rainfall is (a) 70 to over 100 in. (the west coast, Bengal and Assam), (b) 30–60 in. (the middle of India), (c) less than 30 in. per annum (north and north-west India), the numbers of milch cows are (a) 11,030,000, (b) 20,450,000, and (c) 5,800,000 respectively, the total for British India being 37,280,000. Of milch buffaloes in the same regions the numbers are (a) 740,000, (b) 9,460,000, (c) 4,850,000, a total of 15,050,000. Of goats in the same regions the numbers are (a) 6,640,000, (b) 21,000,000, (c) 10,030,000, total 37,670,000. Only 15% of the goats produce milk.—E. M. J.

BACHARACH, A. L. [M.A. (Cantab.), F.R.I.C.] (1945.) **Science and nutrition.** pp. xii + 142. 1 table. London: Watts & Co. 8vo. 2nd Edit. (revised). 5s. **506**

During the past few years general interest in various branches of science, especially nutrition, appears to have increased considerably: this second edition of "Science and nutrition", which has been considerably extended by the addition of information obtained since the publication of the previous edition, is therefore very welcome.

The book is divided into the following five sections. Section I, "The experimental basis", includes an introduction and a chapter on the use of animal experiments. Section II, "Classical nutritional science", consists of seven chapters dealing with the chemistry and metabol-

ism of carbohydrates, fats and proteins. Section III, " Minerals ", contains three chapters dealing with the major mineral elements, the hormones and iodine, and the trace elements. In the five chapters of section IV, " Vitamins ", the nature of vitamins, their detection, measurement, identification and diseases arising from their deficiency are discussed. The fifth section, " Diet and human health," consists of two chapters on the necessity for and the absence of the optimal diet. There is also a useful index.

The primary object of this book is to instruct the non-scientific reader and to this end the remarkable developments in the field of experimental nutrition during the last 30 years or so are simply and accurately described, together with an outline of the fundamental facts of nutritional science.—R. ALLCROFT.

PRICE, W. A. [M.S., D.D.S., F.A.C.D., Member Research Commission, American Dental Association.] (1945.) **Nutrition and physical degeneration. A comparison of primitive and modern diets and their effects.** pp. xviii + 527. 154 figs. Redlands, Calif.: The Author. 4th printing. 13s. **507**

This book presents the results of the author's inquiries into the dental conditions of some of the more isolated and primitive communities of the world and their relationship to the diet. The low incidence of dental caries amongst these races is in marked contrast to the high incidence amongst more highly developed communities. Examples are cited of the physical degeneration of primitive races by contact with civilization and through eating the white man's food. Disobedience of natural laws and the evils attendant upon it are exemplified by soil depletion and deterioration of animal health. In a supplement to the main part of the book the argument continues in much the same vein.

The author claims to have discovered a new vitamin-like substance (" activator X ") in the butter of cows grazing on high quality pasturage which he can estimate chemically by an old reaction [used for vitamin D in early vitamin chemistry, but which has long since lapsed into oblivion]; data and charts are given to show its important nutritional role and its effect in the control of caries and the healing of fractures. The book concludes with a discussion of what is described as our modern degeneration and with nutritional programmes for race regeneration. The secret is said to be in getting back to nature and obeying her laws.

The book may be regarded more as a lengthy speculative essay than as a scientific exposition of the subject matter suggested by the title.—A. E.

COURRIER, R. [Membre de l'Institut et de l'Académie de Médecine, Professeur au Collège de France.] (1945.)] Endocrinologie de la gestation. [**Endocrinology of pregnancy.**] pp. ix + 399. Paris: Masson & Cie. 4to. Fr. 465. **508**

Great advances have been made in the last few decades in the study of the hormonal phenomena associated with pregnancy. To keep abreast of these researches is no easy task and Professor COURRIER has performed a valuable service in preparing this review, which presents a working picture of the essential hormonal processes dominating the physiology of pregnancy from the time of ovulation to the suckling of the young.

The book is arranged in five main sections. In the first, the author reviews the researches into the development of the ovum, its implantation, the placental development in normal and ectopic pregnancy and the effect of suckling on implantation. In the second section, he discusses the changes which occur as gestation proceeds, in the ovary, the genital tract, the pelvis and the mammary glands. The third section is concerned with current knowledge of the distribution of the sex hormones in the body fluids and tissues during pregnancy. This section is prefaced by a useful summary of the chemistry of the steroids. In the next section, the author examines the endocrine factors by which pregnancy is maintained, by which it may be interrupted and by which it may be prolonged. The last section is concerned with a study of the endocrine role of the placenta and of the all-important pituitary, corpus luteum, placenta system.

The author has selected his material carefully to give not a mere catalogue of references but a most readable and interesting discourse. Moreover, the material has been chosen with great fairness. Omissions which could give a false impression of the merits of a theory, or of the priority of a discovery, have not been noticed.

It is pointed out that much of the book was written during the German occupation of France, when current Allied journals and books were not available. There is thus no mention of the recent British and American work on the endocrinology of mammary development and lactation, or on the identity of " relaxin "; neither is there mention of the very extensive hormonal experiments on multi-foetation in sheep carried out in the Soviet Union. However, omissions such as these are partly compensated for by the inclusion of French and German work not generally known to workers in this country.

Reviews of the endocrinology of reproduction are generally disappointing to the veterinarian in that they concentrate on endocrine phenomena as they occur in the human being or in the smaller

laboratory animals, while experiments on the domestic animals, if noted at all, receive only the slightest mention. In this respect COURRIER's monograph is pleasing to the comparative endocrinologist, for the phenomena in the domestic animals have received attention, although not in great detail.

There is a useful bibliography of some 1,400 references with titles. The indexing of surnames commencing with " Mc- " is confusing : McPhail, for example, appears under " M ", while McKeown is indexed under " K " ; in the text the names are generally correct. It may also be noted that on p. 192, the quantities of the isomeric pregnandiols in the urine of pregnant mares quoted from MARKER *et al.* require amendment according to the correction published later [*J. Amer. chem. Soc.* (1939.) **61.** 2537].

This monograph is a valuable contribution to endocrine literature and can be recommended alike to the research worker, the teacher, the practitioner and the student.

It is unfortunate that the binding of the book is of such poor quality.—ALFRED T. COWIE.

BRACHET, J. [Chargé de cours a l'Université de Bruxelles.] (1944.) Embryologie chimique. [**Chemical embryology.**] pp. 509. 127 figs. Paris : Masson & Cie. 8vo. £2.11.9. **509**

Chapter I, on problems and methods, gives a good account of qualitative and quantitative ultra-micro-methods of analysis, in which amounts of material are measured in **Y** [μg.] or less. The rest of the book recounts the results to date of the application of these methods to specific problems of cellular biology, as they appear to an experimental embryologist.

It deals with the chemical basis of sex determination (including interesting recent work on lower sexual forms) ; gametogenesis ; the biochemistry of fertilization ; segmentation ; nucleic acids in development (theories of protein synthesis and nuclear phenomena) ; growth, differentiation, and metabolism ; the chemical embryology of invertebrates ; the chemical embryology of amphibian eggs ; the metabolism of the organizing centre, the mechanical nature of the inducting substance, and regeneration. Under each heading a great deal of evidence is fairly presented.

While B.'s enthusiasm makes an inspiring story, it is instructive to read between the lines the limitations of present understanding of fundamental processes. For instance, the question of protein synthesis, underlying all aspects of development (not only in embryology, but in growth, pathological reactions and much besides), is shown to be a matter of theories of some plausibility, but lacking as yet the means of proof. The method of treating the subject gives valuable indications of future aims. Thus developmental problems of economic importance, such as mammalian fertility, demand the ingenuity in chemical investigation now directed to lower forms.

The volume gives first place to experiments on metabolism. The important physico-chemical aspects of cell organization are briefly discussed. Comparison with NEEDHAM's standard works is inescapable [NEEDHAM, J. (1931.) " Chemical Embryology ", and (1942.) " Biochemistry and Morphogenesis ", both Cambridge University Press, the latter evidently not seen by BRACHET]. BRACHET's work is more readable, the connecting threads of embryological principles being more to the fore. However, it does not attempt to rival the English works as a source of reference or as a system of biochemistry.—T. H. FRENCH.

GORDONOFF, T. [Dr. med., Dozent für Pharmakologie und Toxikologie an der Universität Bern.] (1945.) Rezeptierkunde. Leitfaden zum Verschreiben und Anfertigen von Rezepten. [**The prescribing and dispensing of pharmaceutical recipes.**] pp. 120. 19 figs. Berne : Hans Huber. 3rd Edit. 8vo. Sw. Fr. 6·80. **510**

This small book provides a most useful introduction to the art and science of prescribing and preparing medicines. Throughout the book the author stresses the value of prescribing for the individual patient, choosing each drug and its dosage with particular regard to the case, rather than resorting to the easier but less satisfactory procedure of prescribing merely a standard proprietary mixture. The text is based on the Swiss pharmacopoeia (" Pharmakopoea Helvetica V ").

Full instructions are given for the preparation of all kinds of medicines, fluids for injection, suppositories, ointments and liniments. The writing of prescriptions and the meaning and importance of each part are covered, and therapeutic and maximum dosages are given in a table. There is a useful table of nearly six pages which gives the incompatible drugs and there is a short account of the use of one drug to reinforce the action of another. There is, however, no index or reference list : the former would be a useful addition, the latter is probably considered beyond the scope of the book, intended for students.

Swiss medical students are fortunate in having this small book, clearly and simply written, to serve as a companion to their pharmacopoeia.

—E. G. WHITE.

4920—Wt.P3—Dd.228—4/47—H.R.G., Ltd.—G.13.

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